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CONTRIBUTIONS.—Subscribers and others will materially assist in making our news accurate and complete if they will send early information of events which take place under their observation. Discussions of subjects pertaining to all departments of railroad business by men practically acquainted with them are especially desired.

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FRIDAY, SEPTEMBER 27, 1907.

President Mellen, of the New York, New Haven & Hartford, has announced that in the matter of the pending merger of his corporation with the Boston & Maine he will "stand pat" and not press the merger until Massachusetts sentiment upon the subject undergoes a change. His statement throws into the foreground of the Massachusetts field where state politics and the merger are now in high ebullition, a situation that is at once suggestive and amusing rather than practical and concrete. The New Haven Company now holds hard and fast through its trustees some 120,000 shares or about two-fifths of the outstanding Boston & Maine stock. Not many single blocks of the stock of size and importance remain outside the 120,000 shares and of the holders of the shares not in that big "bunch" a large majority undoubtedly want the merger and yearn for the addition of one per cent. in dividends in the proposed share for share exchange. The New Haven has not formal and legal control of the Boston & Maine. But "standing pat" it has moral and, in a very large sense, practical control present and prospective; it has drawn an impassable dead-line against any outside and rival control of the Boston & Maine; it is saving some \$180,000 a year in dividend payments on the remainder shares; and, in times of general fiscal stress, it is postponing the cares of Boston & Maine operation and direct responsibility for improvements. So placed on his battlements of vision it is hardly strange that President Mellen is willing to put forth his gentle placebo as he watches the surging railroad politics of the Bay State sure to subside at about the date of the next meeting of the state legislature into passionless levels of common sense.

There was a discussion at the September meeting of the New York Railroad Club about the comparative merits of the electric and steam locomotive that, in its general tone, indicated a coming together of the interests represented by the two rival powers. It was recognized by both sides that the ill-advised claims of ill-informed advocates should be given scant consideration. One electrical engineer came forward with the broad admissions that it would cost much to electrify any road and that for existing traffic it was doubtful if that cost would be warranted by the savings that would be effected. There are, however, other important advantages, possibilities of greater train frequency, absence of smoke, more rapid acceleration, high speeds possible on adverse grades and the like; all of which would tend to attract traffic. On the other hand figures were given in which it was shown that the cost of operating and maintaining electric locomotives was far in excess of that required for the steam machine, and this was supplemented by the

usual claims as to the advantages of a multiplicity of units, and the flexibility of operation that would be thus obtained. Yet with these two opposite positions there came from each an acknowledgement that the other possessed advantages that would force its consideration and adoption in certain places to which the rival power was not well adopted. In all this discussion it must be remembered that there is much of surmise. Locomotive statistics at best are elusive and unsatisfactory, and when it comes to electric operation there has not yet been enough of it to afford facts for valuable comparisons. The cost of operation and maintenance of the electric locomotive are for the most part based on the estimates of car operation costs, and that this is a sound basis is by no means sure. This will be evident from statistics of various locomotive costs on roads using different types of engines. For example, to take extreme cases, no one would think of basing the probable costs of the heavy Pennsylvania consolidations on the statistics of the New York elevated roads when they were operated by steam, and it seems equally unreasonable to base the probable performance of heavy locomotives on what is now done in the subway. It is coming to be generally felt that the electric locomotive has a field of usefulness which will be constantly widening, but that this field is not yet large enough to include the whole realm of railroad operation. We hope and believe that this fair-minded discussion at the New York Railroad Club marks the end of hysterical claims and counter claims as to the advantages and disadvantages of the electric locomotive. The course to be pursued is to pay close attention to details, watch the results of every development and then make use of such advantages as may be developed by experience.

THE GROWTH OF TRAFFIC.

The preliminary statistical report of the Interstate Commerce Commission for the year ending with June, 1906, shows one fact of great significance, which deserves more attention than it has received. The increase in freight traffic during that year was altogether unprecedented, and equal to the aggregate increase for the three years next preceding.

For five years this traffic has been:

Years.	Millions of ton-miles		
	Total.	Over previous year.	Per cent. of increase.
1902.....	157,289	10,212	7.0
1903.....	173,221	15,932	10.1
1904.....	174,522	1,301	0.9
1905.....	186,463	11,941	7.4
1906.....	215,878	29,415	15.9

The increase of traffic which had been 29,174 millions of ton-

miles for the three years from 1902 to 1905, was thus 29,415 millions in the one year from 1905 to 1906. This alone is sufficient to account for the traffic blockade of the last year. We had had great and sudden increases theretofore, but none like this. The largest increase in any one year had been 18,939 millions of ton-miles, from 1897 to 1898. From 1893-94, the year of lightest traffic for a number of years, to 1898, the increase was 38 per cent.; from 1902 to 1905, 42 per cent.; from 1898 to 1902, 18½ per cent. It certainly seemed unreasonable that in a single year after 1905, when traffic was already much larger than ever before, there should be a further increase of 16 per cent.

Of course this is a rate of growth which cannot be maintained. It would mean that traffic, and approximately production, should more than double every five years; and in a country where the growth of population is not more than 2 per cent. a year this is, of course, impossible.

Actually, however, the growth of traffic in this country is one of the marvels of the world's industrial history.

The 80,335 millions of ton-miles in 1894 has become 215,878 millions in 1906, an increase of 144 per cent. in 12 years, which is an average of nearly 10 per cent. yearly. This has been possible only by the development of mineral resources, in which the production per man employed is great in weight, distant from markets, giving many ton-miles per ton produced. The number of ton-miles per inhabitant in 1906 must have been approximately 2,540. There is nothing comparable to this in any other country.

While there has been some growth in traffic in every year but one since 1894, the fluctuations have been great. Aside from a trifling decrease from 1896 to 1897, we have gains (in millions) of 18,939, followed by 9,590, 17,932, 5,478, in the years from 1898 to 1901. To make accurate provision for a growth so fluctuating is not possible. Facilities increased at the rate of 10 per cent. a year would have been superfluous in 1901 and 1904 and inadequate in 1898 and 1906. The programs for tremendous increases in facilities made by a very large number of companies two years or less ago, if they could have been executed in the shortest possible time, as was intended in many cases, would most probably have exceeded the requirements of traffic. Inability to secure all the capital needed has postponed many of these enterprises, and if the money could have been secured it is hardly probable that the men and materials could have been had. It is true that a large part of the improvements were needed for the prompt and economical conduct of the traffic as it was. But we may be pretty sure that provision for an annual growth of 16 per cent., like that of 1906, would be excessive.

Passenger traffic has never grown in this country like freight traffic. It was lighter in 1895 than in 1891; and not quite 14 per cent. greater in 1899 than in 1891. But since 1899 the growth, if not so great as that in freight traffic, has been much greater than that in population. The 25,176 millions of passenger miles in 1906 were more than twice as great as the travel in 1897; and in these years the growth of trolley travel has probably been greater in proportion. The steam railroad travel in 1906 was at the rate, approximately, 296 miles per inhabitant, which is not equaled in any other country for which we have statistics. Since 1901 this travel has been:

Year.	Millions of pass'g'r-miles		
	Total.	Over previous year.	Per cent. of Increase.
1902.....	19,690	2,336	13.4
1903.....	20,916	1,226	6.2
1904.....	21,923	1,007	4.8
1905.....	23,800	1,877	8.6
1906.....	25,176	1,376	5.8

The growth is constant and rapid, but not equal to that in freight. Since 1895 the gain has been 106½ per cent. in passengers and 153 per cent. in freight; since 1901, 45 per cent. in passengers and 47 per cent. in freight. In the census year the travel was 211 miles per inhabitant; in 1906, as we have said, about 296 miles.

THE DIFFUSION OF RAILROAD SHARES.

A somewhat cheering symptom of the past year of stress in American railroad securities has been the repeated reference to the increased number of separate holdings of shares in railroad corporations. Not infrequently nowadays railroad presidents in interviews for publication or in their annual reports "point with pride" to their waxing number of shareholders. Sometimes the fact is illusory or even negative in its meanings. A big holder of shares in a conservative railroad—say an insurance or trust company—decides to split up its block for disposal in the market and does so

successfully; or, again, a big speculative holder of intrinsically speculative railroad stocks decides to subdivide and "unload." That means, usually, the substitution of a lot of small speculators for one big one, an enlarged area of speculation, the raising—and shearing—of a new flock of Wall street lambs, and a positive evil. But, taking the railroads as a body, diffusion of shares is a wholesome sign. It is of special import in such a period as the present one of collision of railroads with the constituted authorities; and, as one branch of railroad science, hereafter it is to be hoped that the statistics of share distribution will be fuller, more accurate and detailed and brought down closer to date than heretofore.

There is difficulty in securing such returns. In some large railroad companies the changes are few and slow, in others very rapid. Many shifts of actual ownership take place without transfer on the books of the company, or with transfer considerably delayed. A trustee may hold, for a time at least, an undivided block of shares for a number of beneficiaries. A broker may do the same for a considerable number of customers. A single stock owner may hold shares in 20 roads, and his individuality is thus multiplied by 20—the flaw of the official returns of the number of depositors in our savings banks thus repeating itself. Some of the blanks of state railroad commissions exact returns of the number of stockholders in the independent railroad corporations. But they generally omit the enumeration for shareholders of component, subsidiary and leased properties, who often far exceed those of the parent company. Yet, even with these limitations, it ought not to be hard to obtain significant returns. Some errors will remain, but they will be in the nature of constants not affecting very seriously the absolute variations of ownership, upward or downward, from year to year, which will tell their own story.

The last and most trustworthy official statement of the number of railroad stockholders in the country goes back three years to the year 1904. In February, 1905, at the request of the United States Senate, the Interstate Commerce Commission gave the numerical returns of railroad shareholders as of June 30, 1904. The total was 327,851. Even for that somewhat remote time the comparisons and contrasts are interesting. There were 55 companies which returned each an enumeration of 1,000 stockholders or more, headed by the Pennsylvania with 44,175 and the Atchison, Topeka & Santa Fe with 17,823, many of the 55 companies being leased lines. The contrasts between the distributive holdings of conservative properties and the centralized holdings of speculative properties are vividly indexed in those returns. One finds Boston & Albany with 8,417 stockholders, Boston & Maine with 7,402, Illinois Central with 9,123, New Haven with 10,842, Old Colony with 5,371, and Baltimore & Ohio—the original ultra-conservative road of the country, and one of the oldest—with 7,132. Contrast with these, Southern Pacific, which had but 2,424 shareholders; Louisville & Nashville with 1,672; Cincinnati, Hamilton & Dayton with 1,558; Missouri, Kansas & Texas with 1,509; Missouri Pacific with 1,361; St. Louis & San Francisco with 1,521; Erie with 4,309, and Wabash with 1,974. It is impressive to note that several of these large systems are surpassed in diffused stock by, for example, the leased Morris & Essex with 2,450 shareholders, and the old Boston & Lowell with 2,168. Some allowances in special cases must, of course, be made. The large distribution of the Atchison (17,823) dates back to original conservatism and diffused investment at Boston; Union Pacific, with stockholders numbering 14,256 in 1904, had in much earlier years its long period as a moderately conservative investment; and allowances have to be made for the effect on stock in certain cases of reorganization and receivership as well as of special Wall street conditions. But these and similar facts do not seriously impair the fact, conspicuous in 1904 though probably somewhat less conspicuous to-day, of diffused holdings in conservative roads and centralized holdings in the roads which are speculative.

During the three years since 1904 there has been, as an absolute fact, a vast increase in distribution. The holders of New Haven stock have increased by several thousand. During the first quarter of the present year the holders of New York Central increased about 2,200 and of Pennsylvania by over 5,000. When the November, 1906, dividend was paid, the Pennsylvania had 40,409 shareholders. The May, 1907, dividend went to 45,496 holders of record. Between May and August 1, there was a further increase of 2,000, bringing the number of stockholders to 47,500, the highest point in the company's history and also probably the largest number of shareholders ever possessed by any American railroad. Of these, 25,100 were men and 22,400, or over 47 per cent., were women. The following table, from the *Wall Street Journal*, shows the rate and

amount of dividends and the number of shareholders of the Pennsylvania during each of the last ten years:

Year.	An. rate.	Dividends.	No. of shareholders.
1897	5 per cent.	\$6,465,170	22,045
1898	"	6,465,236	23,725
1899	"	6,465,266	24,690
1900	"	8,781,170	26,032
1901	"	10,857,672	26,305
1902	"	12,262,491	28,675
1903	"	14,702,931	41,474
1904	"	17,933,034	44,396
1905	"	18,113,977	41,030
1906	6 1/2 "	19,869,661	40,409
1907, May.	"	10,906,784	45,496
1907, August	"		47,500

To some extent, doubtless, these increases in the number of shareholders of standard railroads during the recent era of low prices, were transitory, but they show a strong trend toward a wider distribution of railroad ownership among small investors. Other causes working in the same direction have been active and forceful. Railroad investment and reinvestment during the two earlier years of the three were extensive, even if affected somewhat by competitive investment in street railways and industrials. Surplus capital during that period was fairly abundant. During the three years, roads for many years speculative have become dividend payers and with enough promise of dividend continuance to attract steady investment. Moreover, there have been large issues of new stock and sales of rights and the convertible bond has been another distributive factor which will not grow less as the periods of convertibility mature. The result is an increase in the number of railroad stockholders of large but undetermined magnitude and not, apparently, much affected by popular and governmental attack on the roads; which, in fact, has probably been a good deal offset by the attraction to investors of low prices and high dividend returns of good railroad shares. As a rough guess, the 327,851 railroad stockholders of 1904 in this mid-year of 1907 probably have risen to about 500,000. Banking houses and trust companies that hold stocks for foreign holders, and the savings banks that, as trustees, hold an immense mass of railroad securities for the poor, enlarge what may be called the "popular" distribution of railroad holdings much further.

Excluding railroad bonds and senior securities, and limiting the subject to shareholders alone, one finds in the half million or more of them in this country a distributed interest so large that it becomes a popular interest also. Shareholders are not all voters, and the "widow and orphan" plea has of late been overworked. But the great and growing size of the stock-owning railroad interest suggests the larger question why there cannot be in the future a closer and more sympathetic relation between the railroads and the people. Cannot the railroads, without any threat even of state ownership, be set before the people as a kind of heritage, a part of their own wealth and heirship, subject only to the conditions of honest financing on the one hand and efficient public service on the other? Is such a view of the future too idealistic after the present fret and fume of the "railroad question" has ended and passion subsided into sense? Perhaps so; but at least the ideal is one to be toiled for. It will not be reached or even approached so long as demagogism foams at one extreme and the selfish craft of the railroad speculator burrows at the other. Radicalism and selfishness never yet have solved such a great public problem and never will. Its real solution must work out through the slow processes of time and experience. Among those processes the constant extension of railroad ownership must be welcomed as one of the most promising. A wide public ownership of its securities gives the American railroad system more basic strength. It accents the contrast—in the long run if not at once—between individual and quasi-popular ownership. It emphasizes the adjective in the trite phrase "public service" as strongly as it does integrity and judgment blended with tact in railroad administration. It reserves final control to the stockholder as a safeguard against abuse, and makes for the publicity that is the most resonant keyword of corporate betterment. That such expansion of railroad stock-ownings begins to be cited now by railroad authority itself adds official tribute to its value.

THE STATION AGENT.

One of the newspaper cartoonists has depicted a station agent, endowed with three pairs of arms, sitting in the middle of his office, the picture of distraction and anxiety, trying to do a half dozen things at once; answering the telephone, filling switch lamps, holding the train-order signal, reporting a train on the telegraph wire,

delivering a mail bag, and attending to passengers desiring to buy tickets or to have questions answered; and, in addition he is using his toes; checking baggage with one foot and marking a dry goods box with the other. This last is the only express-agent function dealt with in the picture. This is by no means all fiction. With only pardonable exaggeration, the picture man gives quite a fair notion of the multiplicity of duties that often presses upon the single attendant at a small station, within the five minutes preceding the departure of a train. If quick witted, energetic and ambitious, a man in such a situation often performs a variety of functions in a way that would do credit to an expert prestidigitator. Yet even the most phenomenally active clerk often has to neglect some of his customers from lack of time; while the "average" station agent, almost necessarily deficient in training, nearly every day leaves some of his patrons dissatisfied. The demands on his time are so numerous and various that only the most agile mind and best trained hands could meet them; and, admittedly, the country agent's mind is agile in only a few directions. From the causes here suggested the service at small stations is everywhere imperfect, and our cartoonist has only reminded us of what has been a common sight for half a century. Can anything be done about it?

We have taken up a subject on which it seems impossible to say anything new, because we are glad to see, a few railroad officers are doing something new. No enterprising superintendent would be at a loss how to make a forward move in the improvement of his station service, if only he dared to spend twice as much money on it as he now does; but possibly it will be helpful to look again at some of the elements other than money. That is an important one; and nobody can expect to work any great improvement in station service without increasing its cost; but, given the money, how should it be expended? A simple increase in salary is a very crude measure, for the most that can be expected from it is to get better men, who will all the more quickly resign and find jobs paying higher salaries.

In view of the irresistible tendency among all intelligent country people to migrate to a city, it would seem far better to do everything possible to improve the agents now at country stations than to try to improve the service there by filling agencies with higher priced men who have had better training elsewhere; for "elsewhere" usually means a city or a large town. Every added year that an agent stays at a small station there is an added prospect that domestic ties will help to keep him there; and an added reason for educating him.

The education of a station agent is a complicated process, but we may perhaps divide it into three stages: the elementary things that he learns by doing them, as assistant agent, under the supervision of his boss; the "advanced" instruction in the same line, which he receives from the traveling auditor or other outside man, or by reading suitable books and adjusting his acts to his increased knowledge; and education in politeness and tact, which is likely to be a comparatively slow growth, for it comes from dealing with men, and the country agent does not have a large or an inspiring variety of men to deal with.

Certain recent measures to improve station agents will be recalled by the reader. One road has put on an increased force of district freight agents and arranged to have them travel more; visit each station oftener. It seems likely that this will afford proportionately too much benefit to the moderately large points and too little to the one-man station; but the principle is good. One or two roads have had frequent profitable meetings of 50 or 100 agents, the meetings being addressed by officers of the Freight Traffic and Passenger Traffic departments. One road did a good thing by more liberally supplying small stations with helpers, thus encouraging the agents to make themselves better. But what has called our attention to this matter at this time is a brief notice in a Missouri paper telling of what has been done by Mr. W. M. Whitenton, Superintendent of the Missouri division of the Chicago, Rock Island & Pacific at Trenton, Mo., who has had a meeting of station agents to "talk shop." Like others before him, Mr. Whitenton seems to be giving undue attention to stations other than the smallest, but we will trust that he may get down to the lower level later. The public, especially the traveling public, wants good service at the smallest stations.

Mr. Whitenton has had several similar meetings before. He says that it will be his policy to foster this frequent exchange of ideas. He holds, rightly, that the agent is a molder of public sentiment toward railroads. "It is he who meets the seeker of informa-

tion about routes and schedules with either polite accommodation or surly indifference. It is from his treatment that the patron takes on a mood of satisfaction or hot resentment. The patron goes back home and, the next day, is called as a juror in a damage case; and his feelings govern his action." Mr. Whitenton intends to have all small claims against the railroad promptly settled, and is looking after the practice of his agents in this respect. This is a feature of Rock Island policy concerning which *Railroad Gazette* readers have already been informed. This superintendent aims to make the agent at the small station see that he can make of himself an important personage, by treating the public with the same politeness that is practiced by the storekeeper or the banker.

Two things are noticeable in this movement. First, it is the superintendent who is managing it, and, second, he is taking for his model, not the experienced ticket seller or freight clerk at some large station, but the local storekeeper or banker. Local agents on American railroads have been instructed too exclusively by traffic men and traveling auditors. We have not the slightest word to say against these men, for their work is invaluable; but the superintendent ought to be able to better their instruction in some directions. He is or should be more thoroughly acquainted with local conditions; and, probably, in most cases the division superintendent is a man who has had a larger all-round experience. He ought to be by far the biggest man whom the station agent regularly sees.

In taking the local retail merchant as a type to be imitated this superintendent recognizes an essential principle. This merchant may not dress so well, or keep books so well as the station agent, and he may know far less; but he has a more powerful incentive to please his customers; and that is where railroad agents lack. As one of the Chicago & North-Western agents has said, the grocer puts on his smile with his clothes the first thing in the morning; and he keeps it on all day. Another reason for emulating the storekeeper is that he is nearby. An agent who tries to take lessons from a better agent may see him only once in three months. The storekeeper who is also postmaster is a useful man to study. He might not be worth ten dollars a month on a railroad; but he "aims to please." Probably he has been selected as postmaster largely for that reason.

The superintendent who sets out to raise the quality of his agents must recognize his obstacles. The bank clerk or store clerk learns to be a successful banker or merchant because he has for teacher the proprietor, constantly "on the job." The railroad superintendent, coming around only once a month, must try in some way to make up for the infrequency of his visits. One reason why conductors manifest a more uniform degree of efficiency than agents is because conductors are thrown together where they can more effectively learn from each other.

Again, it is to be borne in mind that learning from each other is not an ideal educational process for agents, or for conductors, either; though it should be diligently carried out where nothing better is available. Essays by agents, telling other agents how they do certain things, have accomplished a great deal of good; but in view of the fact that the third course in the station agent's education—training in affability and alert anticipation of customers' wishes—is the one which is now engaging attention, and of the fact that these qualities are not likely to be described in instructive detail and with enthusiasm by a modest person who exercises them, it will be much more effectual to educate in some other way. The superintendent, as teacher, should show to his agents vivid word-pictures of actual men who have achieved excellence in the diplomatic art. If the superintendent is not himself a good lecturer let him hire a man who is. Follow the teaching theory to the further extent of requiring the pupils to show in writing how well they have grasped what has been told them.

The young country station agent is susceptible, probably in a large majority of instances, of a tolerably satisfactory polish; the question is whether a strong railroad, employing brilliant men for general officers can afford to continue to let such agents educate themselves, and as a result reap two-cent fare laws, passed by disgruntled legislators whom nobody has ever tried rationally to placate.

The most difficult agent to deal with is the one who does his work well but is usually so cold-mannered or weary as to be classed by passengers as "cross." It is inexcusable to appoint such a man. The best way to test a candidate in this respect is to see how well his sense of humor is developed. We have no form of test examination to offer, but by way of illustrating the point we will mention an agent who evidently has this sense—Mr. E. T. Abbott, of the

Southern Pacific. Our opinion of Mr. Abbott's fitness is based on his card, a copy of which reads:

Incidental, "keeping out of jail" Open to proposals for other positions.
"Anything" I ain't "isn't."

E. T. ABBOTT THRALL, CALIFORNIA

Station Agent Southern Pacific Co.	Weyerhaeuser Land Co.
Agent Wells Fargo Express Co	Klamath Lake R.R. General Mgr.
" W. U. Telegraph Co.	" G. F. & P. A.
" Sunset Telephone Co.	" Pur. A. & R. M.
Postmaster	" Chief E. & M. M.
Landlord Thrall Hotel	Superintendent Schools
Manager General Store	Subject to R. R. Commission Cal.
Local Agt. Pelton R. Sugar P. L. Co.	" " Oregon
" Pokegama Sugar P. L. Co.	" Inter-State Com. Com.
Klamath River Imp. Co.	

Mr. Abbott, we venture to guess, would make a good lecturer for station agents' meetings.

Car Efficiency for Three Months.

The Car Efficiency Committee of the American Railway Association has issued a statement for the three months to April 1, 1907, showing freight car performance, and car balances, and giving some comparisons with the records for the last six months of 1906 (which were noticed in the *Railroad Gazette* of August 30). The average ton miles per car per day for the three months were: Group 1, 164; group 2, 364; group 3, 363; group 4, 226; group 5, 341; group 6, 307; group 7, 531; group 8, 308; group 9, 252; group 10, 350. (The groups correspond to those of the Interstate Commerce Commission.) We quote the principal explanatory paragraphs of the report:

"This bulletin is the first general compilation covering a period subsequent to the increase in the per diem rate which was made effective on certain roads December 1, 1906, and is therefore of interest for purposes of comparison tending to show the effect of the increase on the car movement. Although the weather conditions during the period covered by this report were not favorable to a high car mileage, the general average shows a decrease of but seven-tenths miles per day as compared with the last six months of 1906. The heaviest decreases in mileage occurred on the roads which were not parties to the car hire agreement, while the car hire roads, with but few exceptions, about held their own. The decrease on all car hire roads averaged but .64 per cent., while the non-car hire roads show an average decrease equal to 5.53 per cent.

"These results would seem to indicate that the increase in the per diem rate to 50 cents, which was made effective July 1, 1907, on all roads in the Association should bring about a general improvement in the movement of cars.

"The generally accepted unit of car performance is the 'average miles per car per day,' but in considering this item, the 'per cent. of loaded mileage' and the 'average loading' should not be lost sight of. An increase in the average miles per car will not benefit a road individually if the increase is made by empty mileage, although such an increase tends toward an improvement in the general efficiency when the movement is made for the purpose of delivering empties to a connection. Neither is there anything gained by an increased per cent. of loaded mileage if the loading of the individual car is decreased proportionately, unless the light loading is in lieu of empty mileage and is made with a view to stimulating movement toward connecting lines and thus facilitating the general interchange of cars. For these reasons, it is equally unsatisfactory to consider the per cent. of loaded mileage aside from the other units.

"For the purpose of combining these various factors and securing a unit which will take them all into consideration, we show an 'average ton-miles per car per day.' This, we believe, provides a very good unit of performance for individual roads, although it is not claimed that it will be useful in comparing one road with another, there being many things entering into this figure which vary according to the operating conditions on the several roads, such as length of haul, capacity of equipment used, class of freight handled, etc.

"By comparing the 'average ton-miles per car per day' for the period of this report, with the figures for the last six months of 1906, it is noted that there was a decrease of only three ton-miles per car per day, or .91 per cent., which is a very satisfactory showing for three winter months. An improvement will also be noted in the 'per cent. of cars in shop' which decreased from 5.48 to 5.02, indicating the efforts which were being made by the railroads to increase the efficiency of their cars.

"There is little change in the figures under 'per cent. of cars on line.' Only about 54 per cent. of the business handled by the

railroads of the country is done with 'home' cars, which confirms the oft-repeated assertion that there already exists a virtual freight car pool, comprising practically all the freight cars in the country, albeit such 'pool' is without regulation other than that provided by the per diem rules. That this general interchange will from time to time be extended rather than restricted, is inevitable, and that this condition is conducive to a higher efficiency (and a consequent economy in operation), than would be possible under a less flexible system of interchange, can hardly be controverted. To be entirely equitable, however, such a system should be regulated by rules which would safeguard the rights of car owners and insure to them the use of their proportion of the equipment, or adequate compensation for any loss they may sustain by reason of an unequal interchange of cars. This principle has been twice affirmed by the American Railway Association."

The New York, New Haven & Hartford, which threatens to withdraw from the per diem agreement because of the cost of borrowed cars, owns 19,970 cars; has an average of 15,742 of these cars on its own lines, and has an average of 20,664 foreign cars on its lines. In other words, it owns about four-sevenths as many cars as are needed to do its business. It is to receive within the next six months 17,000 new cars. An interesting freight car item not shown in this report, but received from another source (a daily newspaper) is that in the month of June the Baltimore & Ohio, moving cars about 67 million miles, made them average 30.5 miles a day. In May, with a still larger movement, the average was 31.7 miles. These averages show about 10 per cent. increase over the Baltimore & Ohio figures shown in the above-mentioned report.

More Railroad Agitation.

Minnesota is the last state to bid for notoriety in the regulation of railroads, and North Carolina, Alabama and Georgia will have to find some new thing with which to attract attention. In Minnesota, last week, Governor Johnson felt called upon to express his condemnation of Judge Lochren of the Federal court for lecturing the legislature. It appears that the Judge, in granting a temporary injunction against the enforcement of the freight rate reductions ordered by the legislature, gave pretty free expression to his opinion of the intelligence and judgment of the legislators, declaring that "such legislation is vicious, and a disgrace to the civilization of the age." What effect the Governor's utterances may have had on the public mind we do not know; but on Monday of this week, Judge Bunn, in a state court, the Ramsey County District Court (St. Paul), issued a writ of mandamus against the Northern Pacific to compel that road to put into effect the freight rate law which Judge Lochren had ordered suspended. Judge Bunn's writ is made returnable October 5. The latest move in Alabama is the sending of a circular by the Montgomery freight bureau asking shippers to give preference to railroads which have not resisted the enforcement of the state laws reducing rates—though Alabama has a law forbidding boycotts. In Texas the Attorney General on Saturday last entered suits against ten different railroads for failure to provide sufficient equipment and neglect in keeping track in order; for alleged failure to operate passenger trains on schedule time; for alleged refusal to receive a loaded car from a connecting line; for alleged failure to maintain a train starter at Fort Worth; for alleged refusal to furnish the commission with a statement of legal expenses; for alleged refusal to turn over a loaded car to a connecting line, and for alleged failure to provide passenger depot accommodations at Denison. In South Dakota the State Railroad Commission, at a meeting held September 20, voted to order all passenger rates in that state reduced October 15 to 2½ cents a mile.

The Public Service Commission of the Second District of the State of New York has issued a code of regulations for the reporting of railroad accidents, which, like the rules for the inspection of steam boilers heretofore noticed, are in the main highly commendable. In making its rules and its classification of accidents as nearly as practicable like that already in use by the Interstate Commerce Commission, the New York Commission has been considerate of the railroad superintendent who has to report accidents to a number of different authorities and whose work is much simplified if he is able to use the same report for all of the different persons or boards to which he must send the information. But in the list of accidents which must be reported by telegraph the New York Board has called for much more than will ever be used. To require telegraphic reports of all collisions involving freight trains will be to burden the telegraph wires to no purpose, for the great majority of the collisions do not demand the attention of a State Board—or, at any rate, they are so numerous that a State Board cannot afford to give attention to them in detail. In the last quarterly bulletin issued by the Interstate Commerce Commission the total number of collisions was 2,078; but more than half of these were classed as miscellaneous, meaning, in most cases, slight accident in yards; and of the 817 rear and butting collisions only 23 were considered

of enough prominence to have their causes explained in the bulletin. If this list of 23 prominent cases were expanded to include ten times as many, it would still contain only about one-ninth of all the collisions and would almost certainly include every case which could be instructively dealt with by a Government Board. And it is to be remembered that the Government record excludes all collisions in which the damage to cars, etc., is less than \$150. Telegraphing to Albany all boiler accidents resulting in serious injury to any person would also seem to be in large measure superfluous. To be scalded by escaping steam from a broken gage glass is a serious injury; but a report of the accident by mail the next day would seem to be sufficient for all practical purposes.

Officers of the Pennsylvania Railroad who have been trying to arouse municipal officers and other authorities to do their duty in relation to the tramp nuisance, have succeeded in stirring up a considerable public interest, if we may judge by editorial expressions which are quoted from prominent papers in Philadelphia, Pittsburgh, Buffalo, Rochester, Cincinnati, Chicago and other cities. These newspaper utterances evince a uniformly sensible attitude. The editors see clearly that the railroads deserve better treatment from the cities and towns. Also, they condemn the unfair practice, common among local officials everywhere, of sending tramps to the next town. Gifts of money for railroad fare and freedom from merited punishment are fully granted to almost any kind of a vagrant on condition that he leave town. This usually aggravates the difficulty which the railroads have to deal with, and does nothing to improve the situation.

Missouri, Kansas & Texas.

The annual report of this company is usually a more interesting document for general reading than that of most railroads, for it is the custom for the officers to discuss the most important facts bearing on the prosperity of the company in some detail instead of giving merely the bare record of the financial and operating results of the year. This custom has not been affected by the important changes in the executive heads of the road during the past two years. Henry C. Rouse, Chairman of the Board, died on April 30, 1906, and was succeeded by Adrian H. Joline, previously Counsel to the company at New York. In November of the same year F. N. Finney, President of the road, resigned, and Mr. Joline succeeded also to his office, becoming Chairman of the Board and President. In the annual report of the company for the year ended June 30, 1907, Mr. Joline, with the viewpoint of the trained lawyer, discusses the present problems which are confronting railroad managers the country over.

In the first place, he frankly admits that notwithstanding the large amounts of new equipment which have been bought during the last five years by the Missouri, Kansas & Texas, the company has found it impossible to keep up its equipment with the increase of its traffic. He then discusses the railroad legislation of the first half of 1907 in the various states and territories through which the road runs. Three new laws in Missouri—one reducing freight rates, one passenger rates and one abolishing bridge arbitraries—are likely, if finally put in effect, to reduce gross earnings of the road by \$230,000. In Kansas freight rate reductions will cost the road about \$100,000 a year, and a general reduction in passenger rates to 2 cents a mile is probable. In the Territory of Oklahoma freight rates have been reduced and the constitution of the new State of Oklahoma just adopted fixes 2 cents a mile as the maximum passenger rate. Texas has passed a number of laws increasing the expense of railroad operation and giving the railroad commission larger powers over rates, and has also changed the tax laws in such a way that the company's taxes will probably be increased by \$200,000 a year. These laws directly affect the company. There is also an interesting example of the indirect effect of railroad legislation. Arkansas has passed a 2-cent-a-mile law, and although the Missouri, Kansas & Texas has not a mile of road in that state, the establishment of the 2-cent rate in Arkansas compels it to reduce through rates from the north to Texas in order to meet the rates of its competitors which operate through Missouri and Arkansas to Texas. As Mr. Joline well says in summing up the railroad legislation of the year, the rate reductions not only deplete the company's revenues from traffic moving wholly within each state, but also those from interstate traffic, the rates on which usually have to be reduced to correspond with the intrastate rate.

The following is an interesting summary by Mr. Joline of the general railroad situation as it affects both the road of which he is the head and other railroads:

"The condition of the crops along your system, although backward, is satisfactory, and promises a large yield. An increased acreage has been planted in cotton, which is expected to offset any decrease in production, which might otherwise have resulted from unfavorable weather conditions during the season of planting and growth. Harvesting, and consequently the movement of the crops, is later than usual. The outlook for the coal business is better than it has been for several years past. The failure of the wheat crop in Texas, and the great damage to that crop in Oklahoma, are factors rather to

your company's advantage than otherwise, as comparatively little wheat is produced along your road, and Texas mills must now draw their supplies from districts where your company is able to compete for the tonnage on most favorable terms. The movement of live stock promises to be fully up to our ability to take care of it. Commercial activity continues unabated throughout the communities served by your railroad; in fact, the industrial development of the territory tributary to your line is advancing with such vigor that only great disaster may check its growth. While the year under review has been one of remarkable prosperity, still, all things considered, it is confidently expected that the earnings will be as satisfactory during the current fiscal year.

"Yet, in spite of the increasing gross earnings and the bright outlook for continued prosperity, the situation of the railroads in the United States is not especially a happy one. We find ourselves without facilities adequate to handle all the traffic offered for shipment, and in an endeavor to meet the requirements, tracks and terminals become congested, motive power and equipment run down, roadway is impaired, men are overworked and other evils ensue tending to make transportation more difficult and vastly more costly for the railroads, as well as unsatisfactory to the public. The remedy for these evils lies in enlarging facilities and increasing equipment, but strange to say, the public, so vitally interested in the question of transportation, has assumed an attitude of hostility towards railroad corporations which has manifested itself in so many forms of oppressive and restrictive legislation as almost entirely to destroy the credit of railroads so far as obtaining new capital for improvements is concerned. At the same time it is impossible for the average railroad company to make extensive betterments from its current earnings, in view of the tremendous increase in the cost of labor, material and supplies. The policy of increasing the burdens on railroads and at the same time diminishing their earning power is neither just nor reasonable. Operating expenses are necessarily inflated to such an extent as to leave little or no balance after the payment of fixed charges and constantly increasing taxes. The legislatures of the several states demand impossibilities and require a reduction of rates, already the lowest in any country, without recognizing the fact that they are depriving the railroads of their income which in most cases would be expended in payment for betterments absolutely necessary for the safe, economical and expeditious movement of traffic. They call for expenditures while refusing to let the railroads earn the money to meet them.

The people of this country are not hostile to railroads; it is the greed and ambition of politicians which are responsible for the unjust requirements imposed. It is gratifying to observe that in Texas the press has, in the main, exhibited a due sense of the right, recognizing the necessity of railroad development in that great state and contributing to the defeat of the two-cent rate bill introduced in the Texas legislature.

"The law-makers have been aided in their assaults by the labor unions. The generous increase in pay and the shortening of the hours of labor have not been productive of increased efficiency. A spirit of unrest, discontent, and almost insubordination has permeated the ranks in nearly all the branches of the railroad service all over the country, and offers a problem for which we can suggest no satisfactory solution, principally because of the scarcity of labor, and especially of the experienced labor required for the safe and efficient operation of railroads. It is a source of gratification to know that these troubles are less serious with your company than with others. Our men are, in the main, loyal and faithful, and if they were left to themselves, without interference from ambitious and self-seeking outsiders, would readily admit that they receive fair treatment and are accorded their just rights.

"Railroad managers have good reason to view the future without optimism. They feel misgivings as to their ability to maintain the present standard of efficiency or to produce net returns as large as those of former years. Statistics show that while so far in 1907 there has been a substantial increase in the gross earnings of railroads as a whole, the net earnings have not gained proportionately.

"The general conditions seriously affect your company, but it is believed that the exceptional development of the country tributary to your railroad will be reflected in future substantial increases in gross earnings; and that on completion of improvements now under way and such others as your company will doubtless find the means of undertaking, such economies in operation may be effected as will offset and perhaps overcome the adverse influences now so prevalent. There are hopeful signs of a growing realization in the mind of the public and of public officials of the true attitude of the railroads, evidenced by a more conservative tone in the recent utterances of the press and of representatives of the government who have hitherto proclaimed radical opinions on this subject; their modified views being the result, doubtless, of the extraordinary depreciation in the value of securities and the consequent uneasiness respecting the future prosperity of our country resulting from the indiscriminate agitation against railroads and the attacks on corporations in general. We believe that the American people are too intelligent and too thrifty to allow themselves to be misled by demagogues into a continuance of a policy which cannot fail to do incalculable injury to the general business of the nation."

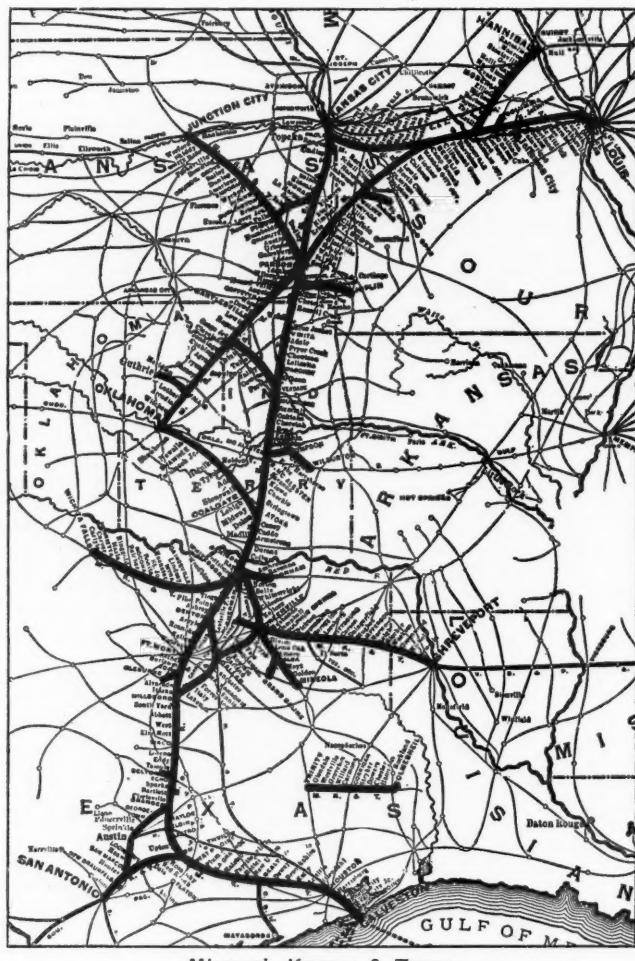
When the actual results of the year for the Missouri, Kansas & Texas are considered, it is seen that it was exceptionally fortunate as compared with most other railroad companies. Gross earnings increased over \$5,000,000, or 24 per cent., while net earnings increased over \$2,700,000, or 48 per cent. This is a year when operating expenses were eating up most or all of the gains in gross earnings made by many other roads. It is apparent, however, from the monthly statements that the same tendencies which have been increasing operating expenses on other roads—in particular the high cost of labor and material—began to show themselves on the Missouri, Kansas & Texas before the end of the year. The road earned 4 per cent. on its common stock after fixed charges and preferred stock dividends in the first six months of the fiscal year and only 5 per cent. in the whole 12 months.

Freight earnings increased \$3,400,000, or 23 per cent., as a result of the largely increased movement of cotton, live stock, coal, ore, lumber and merchandise. The only commodity which showed

material decrease in tonnage was grain, which, however, had nearly doubled in 1906 over 1905. Even in the case of this commodity the reduction in tonnage is less than one-half of 1 per cent.; though grain furnished only 9 per cent. of the total tonnage as against 11 per cent. in 1906.

Passenger earnings showed a gain of \$1,120,000, or 22 per cent., due principally to two causes; the rapid growth of the country through which the road runs, and the popularity of the "Katy's" passenger service. Passenger earnings in 1905, the year of the St. Louis Exposition, were \$4,900,000. They rose last year to \$6,200,000. In February, 1906, a fast mail train was put in service between Parsons, Kan., and Denison, Tex., in connection with the St. Louis & San Francisco. Largely as a result of this service, during the last fiscal year the mail earnings have increased \$148,000, or 39 per cent.

Operating expenses were larger by \$2,250,000, or 15 per cent., yet in spite of all the unfavorable conditions mentioned, the ratio of operating expenses and taxes to gross earnings was 68 per cent., as against 73 per cent. in 1906 and 75 per cent. in 1905. Operating expenses include over \$500,000 spent on betterments to the lines in Texas where the State does not allow improvements to be capi-



Missouri, Kansas & Texas.

talized. The proportion of conducting transportation to gross earnings—for years the weakest point in the operation of the road—has been slightly reduced. It was 40 per cent. in 1905, 39 per cent. in 1906, and 38 per cent. last year. The cost of conducting transportation was 20 per cent. larger than in 1906.

Maintenance of way cost less in total and per mile operated. The cost per mile was \$1,129 against \$1,231 in 1906. The road leases its entrances to Kansas City, San Antonio and Galveston and several stretches of track on its branch lines, including a new connection from Austin, Tex., to San Marcos, 30 miles, owned by the International & Great Northern which it began to use July 1, 1906. Therefore the unit maintenance of way figures are probably too low, for the M. K. & T.'s share of the maintenance of some of the leased lines is likely to be included in the rental. The total payments for rentals for the year were \$478,500. Unit figures for maintenance of equipment cannot be worked out as detailed figures for the operating accounts are not given in the report.

One of the great weaknesses of the road has been its heavy grades in the southern part of Indian Territory, which have greatly hindered efficient operation. Work is now under way on the reduc-

tion of both north- and southbound maximum gradients to 0.4 of 1 per cent. compensated between Atoka, Ind. T., and the Red river, the Texas boundary. The clearing and concrete work has been finished and providing it is possible to get the necessary labor, the lack of which has been one of the greatest difficulties throughout the undertaking, all the grading will be finished this fall. Certain sections of the new line are already nearly ready for operation and it is expected that heavier trains can be run over this part of the road by the end of the year. North of Atoka, between that point and McAlester, Ind. T., the cutting down of the two largest southbound and a northbound grade has been begun. This part of the road also, as improved, it is hoped to put in service before the end of the year. Surveys for grade reductions as far north as Parsons, Kan., are under way and nearly finished. When all these grade reductions are finished there is to be a 0.4 of 1 per cent. grade from the Red river north to Muskogee, Ind. T., and a 0.3 of 1 per cent. grade from Muskogee north to Parsons, Kan. It is expected that on the new grades an engine will be able to haul double the freight tonnage which it can pull at present over this part of the road.

The principal results of operation are given below for the last three years—a fine record of progress:

	1907.	1906.	1905.
Mileage worked	3,072	3,043	3,043
Freight earnings	\$18,402,825	\$14,968,834	\$14,134,335
Passenger earnings	6,278,608	5,157,881	4,935,592
Gross earnings	26,183,950	21,159,145	20,041,095
Maint. of way and structures	3,467,910	3,746,241	3,643,201
Maint. of equipment	2,914,953	2,044,313	1,925,195
Conducting transportation	9,903,801	8,224,348	8,114,061
Operating expenses	17,249,134	14,990,298	14,568,436
Net earnings	8,934,825	6,168,847	5,472,659
Net income	3,682,311	1,653,088	1,267,191
Year's surplus	3,162,311	798,424	29,049

Chicago & North-Western.

The most noticeable fact in the record of the Chicago & North-Western this year is that there was no appropriation from income for construction, improvements and permanent additions, as there has been for years past. For the last seven years such annual applications of income to the betterment of the property have averaged over \$4,000,000 a year, and in 1906 there was \$6,000,000 thus set aside. The failure to make any such appropriation last year is a striking change in policy, for the company has long been notable for the large improvements to its property made out of surplus income year by year. The change may have been due to the difficulty of raising railroad funds in the present market and the consequent desirability of having as large an amount of surplus funds on hand as possible, or it may be connected with the new system of

stock available for future issue. There is no likelihood at the present time, when the cost of labor and materials is at a maximum and when new stock could be sold only at a minimum figure, that a further extension of one of the company's western lines to the Pacific coast will be undertaken; but as long as there is this large amount of stock in the treasury the possibility of a through line to the coast by a railroad which already covers two-thirds of this distance, but which now gets an average haul of only 144 miles on all its freight traffic, will be a live one.

The year's gross earnings were thoroughly satisfactory. They increased \$5,400,000, or 8 per cent. over 1906. But operating expenses were \$5,000,000 larger, leaving a nominal gain of only about \$400,000 in net earnings. Passenger earnings increased more proportionately than freight earnings; 12 per cent. for the former against 7 per cent. for the latter. The largest increase was in earnings from first-class passengers; the smallest in earnings from commutation passengers. There was a slight reduction of the passenger-mile rate during the year, due probably to the reduction of fare to 2½ cents a mile early this year in Wisconsin, but in spite of this the average passenger train earnings per mile increased by 6 per cent. The earnings per ton-mile were exactly 9 mills, a slight increase over the previous year, and there was an increase of 3 per cent. in the earnings per freight-train mile. Car loading was more efficient by 6 per cent., but the trainload increased only 0.4 per cent.

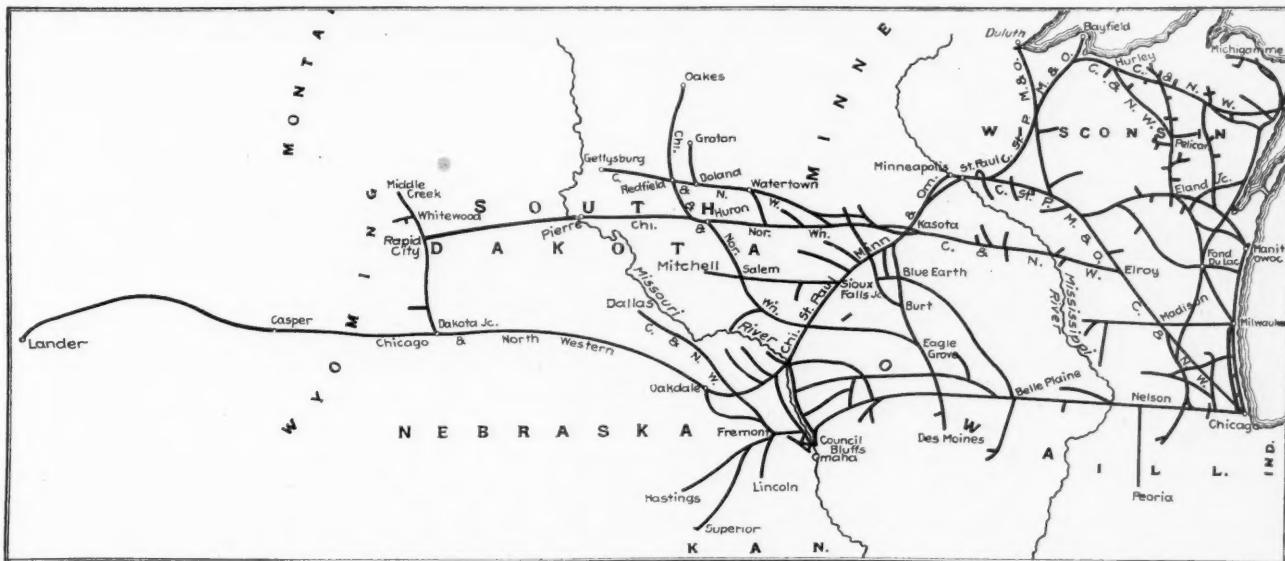
The North-Western analyzes its maintenance expenditures in considerable detail, perhaps because they have long been so low that frankness is essential. It is one of the few roads which gives separate figures for renewals and repairs of equipment. From these we learn that nothing was spent on replacement of passenger cars during either of the last two years, and nothing on new locomotives purchased for replacements in 1907, while between \$2,000,000 and \$3,000,000 was spent on renewal of freight cars in each year. The following table gives in some detail the unit maintenance charges for way and equipment during the last two years:

Unit Maintenance Expenditures.	1907.	1906.
Maintenance of roadway and track per mile*	\$866	\$678
Maintenance of way and structures, per mile.*	1,185	929
General repairs of locomotives, per locomotive.	1,684	1,559
Reprs and renewls locomotives, per locomotive.	1,684	2,340
Of passenger cars, per passenger car....	475	455
General repairs, freight and work cars, per car.	46	35
Reprs and renewls, freight and work cars, pr car	84	83
Of freight cars, per car.†.....	84	84

*Not including trackage.

†Not including work cars.

These equipment figures are low, lower than would seem possible for a road like the North-Western, if it were not that it has been



Chicago & North-Western.

depreciation accounting prescribed by the Interstate Commerce Commission for use in the fiscal year now under way.

Not having any such ambitious plan on hand—openly, at least—as its neighbor and competitor, the Chicago, Milwaukee & St. Paul, the North-Western has not, during the year, expanded its capital to any such extent as the St. Paul. In fact, more new stock was issued in the 1907 than in the 1906 fiscal year. In February, 1907, an issue of \$24,400,000 common stock was made, bringing up the total capital outstanding to \$124,000,350, of which \$22,400,000 is preferred and \$101,950,000 common. At the annual meeting on October 18, 1906, however, additional common stock sufficient to bring the aggregate capital of the company to \$200,000,000 was authorized, so that the North-Western has nearly \$75,000,000 common

spending so little for years. The appropriation of \$2,200,000 for freight and work car renewals is all that saves that item from being entirely too small in this day of high costs, to keep the freight equipment intact. Last year, for the first time in the history of the road, there was over \$1,000 per mile spent on maintenance of way. This includes all charges under that account, that is, repairs and renewals of interlocking plants, block signals, bridges and culverts, buildings and fixtures, docks and wharves, fences, road crossings, signs and cattle guards and sundry miscellaneous charges, besides the direct charges for roadway and track which, as shown in the table, amounted even last year to only \$866 per mile. As in the case of the St. Paul, which spends even less per mile on maintenance of way, the large proportion of branch-line mileage and the

long stretches of road in prairie regions where for most of the year the traffic is light, goes far to explain this fact; yet in comparison with other high grade properties, the amount spent by the North-Western in maintaining its permanent property is astonishingly low.

Three new lines have been opened for traffic during the fiscal year: the extension from Casper, Wyo., west to Lander, 148 miles, bringing the westernmost terminus to within 200 miles of Pocatello, Idaho, on the Oregon Short Line; a relief and connecting line 123 miles long, north and west of Manitowoc, Wis., and a parallel double-track line 50 miles long from Milwaukee south to a connection with a similar line previously built extending north from Chicago, this last piece of construction giving the North-Western four main tracks between Chicago and Milwaukee. The extension from Pierre, S. Dak., on the Missouri river, west to Rapid City, 164 miles, has been opened for traffic since the close of the fiscal year. It is not, however, yet connected with the eastern lines because the bridge across the Missouri river at Pierre is not yet finished. This bridge is being built by the Pierre & Fort Pierre Bridge Railway Company. Its sub-structure of seven masonry piers is finished. The steel superstructure consists of four fixed spans each 350 ft. long and a draw span 445 ft. long. It is expected that the bridge will be opened for freight traffic by the end of next week. One or two other short extensions, which will be found listed in the Railroad Construction column, have also been undertaken.

Plans for the new passenger terminal in Chicago are indicated in the report. The new terminal is to have 16 tracks elevated above the plane of the street, with two elevated four-track approaches, one

The Chicago, St. Paul, Minneapolis & Omaha, which operates 1,700 miles of the North-Western system, had gross earnings of \$14,000,000, net earnings of \$5,000,000, net income of \$2,800,000 and surplus for the year, after paying 7 per cent. on both its common and preferred stock, of \$756,000. The Chicago & North-Western received \$1,029,000 in dividends from its subsidiary.

The principal results of the last two years' operation of the Chicago & North-Western Railway are summed up in the following table:

	1907.	1906.
Mileage operated	7,551	7,429
Passenger earnings	\$16,111,789	\$14,441,415
Freight earnings	49,083,246	45,802,853
Gross earnings	68,878,931	63,481,578
Maint. way and structures	8,904,941	6,864,898
Maint. of equipment	8,713,026	9,032,135
Conducting transportation	25,990,596	22,786,687
Operating expenses	44,781,025	39,789,099
Net earnings	24,089,906	23,602,479
Net income	15,740,566	14,800,553
Dividends	7,910,178	6,413,914
Betterments and additions	0,000,000	0,000,000
Year's surplus	7,830,388	2,316,639

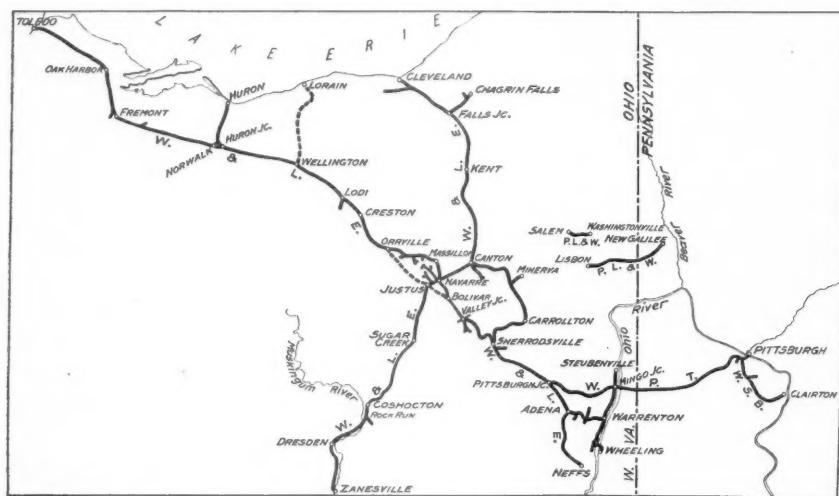
Wheeling & Lake Erie.

It was in June, 1905, that B. A. Worthington, now First Vice-President and General Manager of the Wheeling & Lake Erie and the Wabash Pittsburgh Terminal, came to these properties. The Wheeling & Lake Erie, therefore, has now been two full fiscal years under the new management. The operating results obtained have been strikingly successful. The road's great handicap has been, and still is even more at present, lack of funds. The problem is not one of getting traffic but of taking care economically of business that can be obtained.

A year ago important improvement projects were under way. A new issue of \$35,000,000 fifty-year, 4 per cent. bonds had been created and \$12,000,000 of this issue used to secure \$8,000,000 three-year, 5 per cent. notes which were sold in August, 1905, at 95. Part of the \$7,600,000 cash thus obtained was used in paying off floating debts, the rest in putting under way various improvements. The most important of these were a cut-off from Bolivar, Ohio, northwest to Orrville, 22 miles, which was to reduce the distance between these points by 6.6 miles, maximum curvature from 9 to 3 deg. and maximum grade from 1 per cent. to 0.4 per cent.; and also a branch, 35 miles long, from the main line to Lorain, on Lake Erie. According to the annual report of a year ago, it was expected that both these new lines would be finished by the end of 1906. A good deal was done on each of them but some time ago work was abruptly stopped because of lack of funds. Not only was it still impossible to sell bonds, but the strongest railroads in the country had to give considerably better terms than those secured less than a year previous by the Wheeling & Lake Erie to place any of their short-term notes.

The balance sheet shows how much the Wheeling & Lake Erie is now in need of money. Cash on hand stood at \$2,500,000 on June 30, 1906, against \$659,000 a year later. Current liabilities on June 30, 1907, exceeded current assets by over \$1,500,000. Although there is probably not a railroad in the country which could not at once profitably use new funds in improving its property, the Wheeling & Lake Erie is a conspicuous example of the handicap of lack of ready capital. The main line between Pittsburgh Junction and Huron Junction can scarcely carry any more traffic than it does, until it is double-tracked. During the busy months of the past year the traffic density on this stretch of single-track was at the annual rate of over 7,000,000 ton-miles per mile of road. The profitable economy of double-tracking this section has been conclusively proved by the records of the operating department, yet there seems to be no immediate probability that this work, the important grade reduction in the neighborhood of Massillon already referred to, or the completion of the Lorain branch where much profitable traffic awaits the road, can soon be carried out. With roads like the Pennsylvania and the New York Central postponing improvements because they cannot get funds, the Wheeling & Lake Erie has no chance at present of making satisfactory borrowings.

In spite of handicaps to economical operation, the operating results for the year were exceedingly satisfactory. In the year previous, even with the loss of traffic due to the coal strike, gross earnings increased 15 per cent. and net earnings 63 per cent.; last year gross earnings again increased 15 per cent. and net earnings 28 per cent. Of the increase of \$1,528,600 in the gross earnings of 1907 over those of 1905, 32 per cent., or less than one-third, was spent



Wheeling & Lake Erie.

The Wabash-Pittsburgh Terminal, the West Side Belt, and the two isolated lines of the Pittsburgh, Lisbon & Western, which company is carried in the Wheeling & Lake Erie's balance sheet at \$418,719, are shown.

from the west and one from the north. The western approach will leave the elevated tracks of the Galena division (the division west toward Omaha) near Ashland avenue and run eastwardly 1.12 miles to Jefferson street. The northern approach will leave the elevated tracks of the Wisconsin division (comprising the lines running northwest and north from Chicago) near Carpenter street and run 0.90 miles southerly to Jefferson street, from which the combined tracks of the two approaches will run 0.3 miles to the terminal at Lake street. There was charged to construction in capital account during the year \$196,640 on account of the new terminal, and the balance sheet shows a further item of \$4,900,000, "Real estate in suspense and advances on account of the new Chicago passenger terminal."

Various miscellaneous improvements were made during the year, including new freight terminal buildings at Omaha and an overhead highway bridge 1,757 ft. long across the new Proviso freight yard at Melrose Park, just out of Chicago on the Galena division. After the close of navigation this year a new iron ore dock 1,404 ft. long and 50 ft. wide is to be built at Ashland, Wis. There was an increase of \$342,000, or over 600 per cent., in the item "repairs and renewals of docks and wharves" under operating expenses, due largely to extension of the company's coal dock at Ashland, Wis., and other similar improvements there.

Two purchases made during the year suggest the trend of the times in eliminating subsidiary companies dealing with the smaller and sometimes independent parts of railroad operation. At Milwaukee the railroad bought two grain elevators with a total capacity of 1,800,000 bu., which adjoin the North-Western terminal in that city. The bridge company which has owned the railroad bridge across the Mississippi river at Clinton, Iowa, heretofore operated under lease, was also purchased.

for operating expenses notwithstanding increased costs for labor and materials, while 68 per cent. was saved for net earnings. As a result, net earnings per mile of road were \$4,522 in 1907 against \$2,164 in 1905, a gain of 109 per cent., while the operating ratio was reduced from 79 per cent. in 1905 to 71 per cent. in 1906, and 67 per cent. last year.

Such favorable results were brought about largely by that most important operating economy, increase in train and car loading. The average train carried 422 tons of revenue freight in 1905, 538 tons in 1906 and 605 tons last year, a remarkably high figure for a road with considerable branch-line mileage. Including company freight, the average trainload last year was 633 tons. The average loaded carload has increased from 26 tons in 1905 to 31 tons last year. At the same time earnings per freight train mile have increased 78 cents in the past two years, while the cost of running a train one mile is larger by only 27 cents. The ton mileage increased 17 per cent. in 1907 over 1906, although only 4 per cent. more freight-train miles were run. Compared with 1905, tons hauled one mile increased 49 per cent. last year, with an increase of only 4 per cent. in train mileage.

The passenger results show the effect of the two-cent passenger law in Ohio. While the volume of passenger traffic in 1907 was about the same as in 1905, there was a decrease of \$46,366, or 7 per cent., in the passenger train earnings in the two years. The average receipts per passenger-mile were \$1.84 in 1905, \$1.81 in 1906, and \$1.66 in 1907.

Detailed figures for the four principal operating expense accounts are given this year for the first time. There was somewhat less spent on maintenance of way than in the previous year. Maintenance of equipment on the other hand was larger by 19 per cent., due, according to Mr. Worthington, "to the large increase in volume of traffic handled and increased equipment to be taken care of with little increase in facilities for keeping it in repair." From the tables given in this year's report it is possible to work out the amounts spent by the Wheeling & Lake Erie for maintenance per unit of track and of equipment during the last four years. These figures are given in the following table:

Unit Maintenance Expenditures 1904 to 1907.

	1907.	1906.	1905.	1904.
Maintenance of way per mile	\$1,648	\$1,793	\$1,657	\$1,555
Repairs and renewals:				
Per locomotive	2,007	1,595	1,662	2,094
Per passenger car	435	735	612	721
Per freight car	35	31	26	28

Interest in this table centers in the equipment maintenance. It is evident that, taking the last four years as a whole, the equipment has been undermaintained, particularly the freight cars. The inventory of freight equipment seems to prove this point as, instead of the expected increase in number of freight cars which so busy a year as 1907 would be likely to demand, there are 147 less freight cars listed. There is, however, a discrepancy between this table and a statement in the first part of the report that during the year 2,009 new gondola cars of 100,000 lbs. capacity were added to the equipment. These are not shown in the inventory. They appear to be cars leased from the Wabash, for which \$195,000 is included in the income account as rental. It is not likely that this item of rental includes the ordinary maintenance of these cars, therefore they have been added to the total freight car equipment as of June 30, 1907 shown in the inventory to get the total figure used in working out the figure for maintenance per freight car in 1907. If these 2,009 cars had not been included—and perhaps as they were new cars and may have come to the Wheeling & Lake Erie late in the fiscal year, it would have been equally fair not to include them—repairs and renewals per freight car for 1907 would have amounted to \$41 instead of \$35 as shown in the table. This does not affect the general conclusion, however, that the road has been and is spending less for maintenance than is necessary to keep its equipment in proper condition.

A statement of classified tonnage is also given for the first time in this year's report. This shows that products of mines make up 70 per cent. and manufactures and merchandise 23 per cent. of the road's total tonnage. There was a particularly large increase last year in the tonnage of bituminous coal and bar and sheet metal carried. The total revenue tonnage was 9,608,590 tons, against 8,571,240 tons in 1906. An unusual figure included in the report is the percentage of "unbalanced" traffic, that is business moving in one direction for which no equivalent traffic was moved in the opposite direction, a class of traffic which tends to reduce train loading and economy of operation. This was 32 per cent. of the total traffic in 1905, 38 per cent. in 1906 and 41 per cent. last year. With this increasing difficulty to contend with, the showing of the operating department appears even more satisfactory. The average net tonnage per locomotive-mile was 571 tons against 633 tons per train-mile. Gross tonnage per train-mile—a figure not often given—was 1,298 tons and gross tonnage per locomotive-mile 1,169 tons.

The showing of the Wheeling & Lake Erie is particularly interesting because its operations are not so large as to obscure a comprehensive view of the happenings of the year. With something like microscopic clearness, it represents in many ways the situation

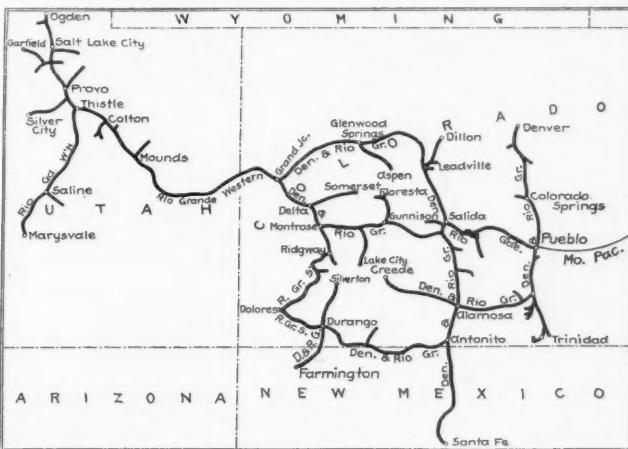
of the other railroads of the country. It has plenty of business and is well operated but suffers a severe and continuous handicap because its traffic has outgrown its facilities and it cannot borrow money to make improvements which would soon pay for themselves in greater efficiency of operation.

The following table sums up the growth of the property during the last three years:

	1907.	1906.	1905.
Mileage worked	442	442	442
Coal freight earnings	\$2,558,969	\$1,915,083	\$1,678,046
Other freight earnings	2,881,759	2,723,869	2,134,415
Passenger earnings	464,736	466,748	524,410
Gross earnings	6,124,207	5,318,801	4,595,607
Maint. of way and structures	728,469	792,513	732,228
Maint. of equipment	1,041,572	871,930	763,899
Conducting transportation	2,197,809	1,951,862	2,015,119
Operating expenses	4,125,370	3,762,156	3,639,135
Net earnings	1,998,837	1,556,646	945,471
Net income	332,229	92,294	Def. 193,360

Denver & Rio Grande.

The Denver & Rio Grande this year presents a strong showing. Both Colorado and Utah enjoyed general prosperity. Labor was peacefully employed at good wages and the mining industries from which the road gets 80 per cent. of its tonnage and 50 per cent. of its revenue, were prosperous. At the same time there was a large movement of general traffic; manufactures, miscellaneous and general merchandise furnishing together 11 per cent. of the tonnage and 33 per cent. of the revenue, against 9 per cent. of the tonnage and 30 per cent. of the revenue in 1906. Instead of cutting down appropriations for betterments and new equipment, as several other roads did last year, the Denver & Rio Grande increased its appropriations for these purposes by \$375,000, with a total of \$1,525,000 devoted



Denver & Rio Grande.

to such purposes. The use of most of the net income in this way is justified by President Jeffery for two reasons; first, because securities cannot be sold except at great sacrifice, and, second, because the authorized bond issues are not far from used up. The total of unissued bonds available for additions and improvements is about \$3,100,000—\$2,100,000 Denver & Rio Grande first-mortgage 4 per cents. and \$1,000,000 Rio Grande Western first consolidated mortgage 4 per cents.

Comparison is made between the condition of the property last year and in 1896, 11 years earlier. The reason for selecting 1896 for comparison is because that year marked the resumption of dividends on the preferred shares (at the rate of 2 per cent. instead of at the present rate of 5 per cent. a year) after the trying period from 1893 to 1895. During the 11 years, improvements and additions have been made from income at a cost of over \$12,000,000, an average of more than \$1,000,000 a year. During this period gross earnings increased 114 per cent. and net earnings 96 per cent. With an increase of only 33 per cent. in fixed charges, 200 miles of narrow gage line were changed to standard gage and 375 miles of line added to the mileage of the road. The mileage of second track increased 121 per cent., the number of locomotives 46 per cent. and their tractive power 110 per cent.; the number of freight cars 72 per cent., and their tonnage capacity 115 per cent. This is a record of steady advancement if not of extraordinary progress.

The gross earnings last year were \$21,400,000, an increase of \$1,700,000 or 9 per cent. over 1906. Operating expenses increased \$1,150,000, leaving net earnings of \$8,150,000, an increase of \$575,000 or 8 per cent. The gross earnings per mile were \$8,564, nearly \$4,000 a mile more than for the year ended June 30, 1896, and net earnings per mile were \$3,263, or about \$1,350 a mile more than 11 years earlier. Of the increase in gross earnings, \$1,280,000 came from freight; \$345,000 from passenger, and \$99,000 from express, mail and miscellaneous earnings.

The maintenance charges were about the same as in the pre-

ceding year except that a great deal more was spent on repairs and renewals per freight car. Maintenance of way and structures per mile cost \$940, against \$975 in 1906 and \$826 in 1905; repairs and renewals were \$2,275 per locomotive, against \$2,277 in 1906 and \$1,970 in 1905; \$500 per passenger car, against \$607 in 1906 and \$446 in 1905; and \$76 per freight car, against \$67 in 1906 and \$44 in 1905. In judging the maintenance of way figure it must be remembered that 795 out of the 2,500 miles operated are narrow gage; the maintenance of equipment figures also include as large or a larger proportion than this of narrow gage equipment. Therefore, figured on standard gage line and equipment, the unit charges would probably be somewhat higher.

Conducting transportation rose from \$6,600,000 to \$7,400,000, an increase of 12 per cent. Every item but three under this account shows an increase. The largest of the three decreases is in "injuries to persons," due to the large increase in this item in the previous year because of the disastrous collision at Adobe, Colo., on March 16, 1906; the other two decreases are small, one in advertising, the other in "other expenses." The principal increases were in engineers and firemen, fuel for locomotives, roundhouse men, freight train service, passenger train service, station service, and switchmen, flagmen and watchmen. Per diem payments rose from \$204,000 in 1906 to \$308,000 last year, an increase of 51 per cent.

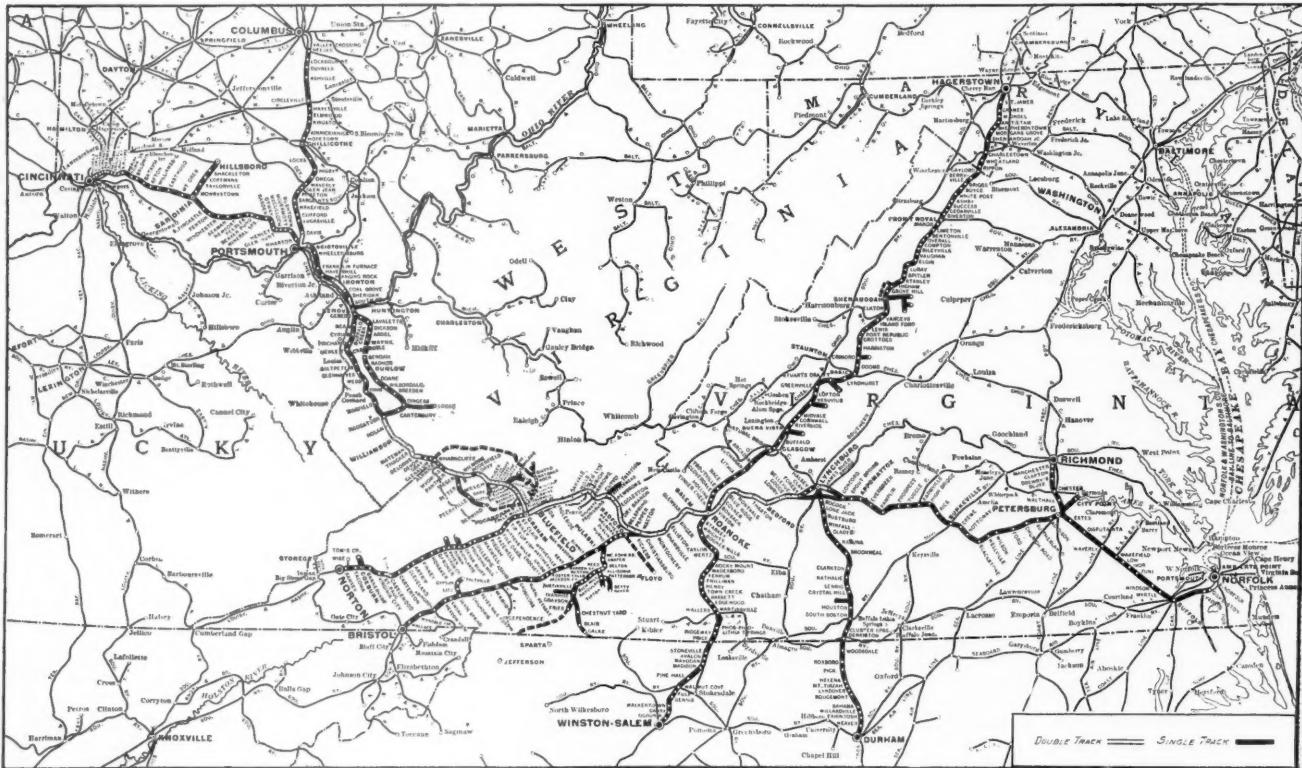
tinuous line of rails from Salt Lake City, Utah, to Oakland, Cal., by September 1, 1908, or very soon thereafter.

The results of the last two years' operation are summarized below:

	1907.	1906.
Mileage worked	2,500	2,477
Passenger earnings	\$4,954,159	\$4,609,428
Freight earnings	15,223,165	13,943,556
Gross earnings	21,409,042	19,656,115
Maint. way and structures	2,349,841	2,415,353
Maint. of equipment	2,940,743	2,566,411
Conducting transportation	7,418,699	6,621,986
Operating expenses	13,252,112	12,104,172
Net earnings	8,156,929	7,581,943
Net income	4,176,797	3,712,474
For betterments, etc.	1,645,000	1,270,000
Year's surplus	244,944	156,839

Norfolk & Western.

During the past year the dividend rate on Norfolk & Western common stock was again increased, so that now 5 per cent. annually is being paid instead of 4 per cent. as in the year before and 3 per cent. in 1905. The road's statement, however, shows a distinct recognition of the present strained condition of the market for railroad funds and of the general uncertainty as to the future of the financial and industrial situation. Extension projects which



Norfolk & Western.

Apparently the Denver & Rio Grande is one of the roads on which the recent car shortages have fallen most heavily. "Clearing wrecks" rose from \$39,000 in 1906 to \$69,000 last year, an increase of 77 per cent., which suggests the increasing laxity of railroad operating labor.

Two new extensions in the Bingham district, Utah, to the newly developed mines and smelters in that region were finished during the year and are now in operation. Already it has been necessary to improve them because the tonnage of low-grade ores to be moved from the mines to the smelters has rapidly increased. The two branches are together 28 miles long, and about \$245,000 Rio Grande Western 4 per cent. consolidated mortgage bonds were issued during the year on their account.

In regard to the Western Pacific, President Jeffery says that work has been delayed by the general scarcity of labor, a difficulty accentuated in its case by the demand for men in San Francisco following the earthquake and fire of April, 1906. On June 30 there were 177 miles of track laid and grading was being done faster than it had been during the preceding 10 months or a year. There has been slow progress at certain important tunnels which must be finished before the through line can be opened. As these threaten to delay the whole work, especial attention is now being given to hurrying this branch of the work and the contractors have been pressed as strongly as possible to make more satisfactory progress. It is hoped and believed that the Western Pacific will have a con-

were spoken of in the report of a year ago as "important improvements yet to be undertaken" are not mentioned at all this year. Smaller appropriations are made out of the surplus income of the year for betterments and equipment than in the year previous. The company is evidently holding cash and postponing improvements. As a result of this policy, the cash on hand stands at \$4,400,000, against \$4,150,000 on June 30 of the year before and \$6,300,000 in 1905. The cash item for 1907, however, will be almost doubled on receipt of \$4,076,000 in deferred instalments of payments on the new convertible bonds which were issued during the year.

Last fall the stockholders authorized \$34,000,000 convertible 4 per cent. bonds. Of this amount \$14,576,000 was offered to stockholders at par last December. Not all was taken by them, but as the issue was underwritten, the company obtained cash for the whole amount, less the underwriter's commission. Stockholders' payments for the bonds were to be made, 40 per cent. on January 31, and 60 per cent. on May 31. From the item shown on the balance sheet, of \$4,076,000 deferred instalments on these bonds, it appears that part of the underwriting agreement must have been the postponement of part of the underwriters' payments until some date later than June 30. The \$10,000,000 which was earlier paid in had apparently already been used by that date. It is reflected in an increase of \$18,000,000 in the assets of the company over June 30, 1906. The Norfolk & Western, like all the other railroads which secured new funds at the end of 1906 on terms which then seemed

liberal, was fortunate to have made its arrangements at the time, for it could hardly have obtained money three months or six months later, and the record shows that the whole amount of these funds was urgently needed to care for the needs of the property which were expanding with or faster than the earnings.

Gross earnings in 1907 were \$31,200,000, against \$28,500,000 in 1906, an increase of 9 per cent. Operating expenses, however, increased 15 per cent., the actual increase being almost as much as the increase in gross earnings. In consequence, net earnings were \$11,650,000, a gain of only \$227,000 or 2 per cent. over the previous year. There was an increase of 15 per cent. in fixed charges, which included taxes heavier by 35 per cent. than in 1906, and, as a result, net income was only \$7,000,000, against nearly \$7,500,000 in 1906. Common stock dividends were larger by over \$600,000 than in 1906, but the betterment appropriation was only \$250,000, as against \$2,250,000 in the year before, the equipment appropriation, however, being \$996,652, as against \$700,000 in 1906. These appropriations together were smaller by \$1,703,348 than in 1906. In this way in spite of an increase of nearly \$500,000 in the amount charged against income for discount on bonds, final surplus for the year was kept at about the same figure as in 1906. If the management could have foreseen the present state of the railroad financial market and the tremendous increases which were to come in the cost of railroad operation, it is probable that they would not have increased the rate of distribution on the common stock as they did, although, thus far at least, the Norfolk & Western is clearly able to pay that amount, having earned 7 per cent. on the common stock last year after appropriations for betterments and other miscellaneous charges, and 9 per cent. if these deductions are included in the surplus after preferred dividends.

There was an increase of 16 per cent. in passenger earnings, due to an increase in number of passengers carried and slight increases in the passenger haul and passenger-mile rate. Freight earnings increased 8 per cent. owing to the same three causes in similar proportions. For the first time in a number of years there was a decrease in the trainload, which fell from 579 to 569 tons.

There was a small decrease in coal shipments and in shipments of pig and bloom iron, while coke tonnage showed a small increase and ore tonnage an increase of 11 per cent. The largest other tonnage increases during the year were in grain; stone, sand, etc.; lumber; cement, brick and lime, and merchandise.

The principal cause for the large increase in operating expenses was the much greater cost of conducting transportation, which increased from \$8,400,000 to \$9,800,000, a gain of 17 per cent. Some of the comparative figures for the two years under the operation branch of this account were as follows: Station service (freight), \$627,000, against \$493,000 in 1906; yardmen, \$438,000, against \$347,000 in 1906; passenger trainmen, \$203,000, against \$177,000; road enginemen and firemen (freight), \$1,691,000, against \$1,413,000; other supplies for locomotives, \$101,000, against \$74,000; elevator and longshore labor, \$175,000, against \$133,000; loss and damage, \$366,000, against \$208,000; clearing wrecks, \$121,000, against \$99,000. Here are clearly shown the large cost of supplies, the greater cost and smaller efficiency of labor, and the general decreased efficiency of operation which is likely to come with great increases in business.

The maintenance accounts both show increases. Maintenance of way per mile rose from \$1,856 in 1906 to \$2,077 last year. Besides this there was \$2,194,000 spent for construction betterments out of the Betterment Fund which has been set aside out of the surplus earnings of this and previous years. Maintenance of equipment as a whole included \$813,000 for replacements and \$160,000 credited to the equipment fund, about the same total amount as was charged in the previous year. Not including replacements, repairs cost \$1,921 per locomotive, against \$2,203 in 1906; \$690 per passenger car, against \$677 in 1906, and \$55 per freight car, against \$51 in 1906. Considering that these include repairs only, the amounts spent are liberal.

A year ago contracts had been let for building two single-track branches which together were to furnish a new low-grade line south of the city of Lynchburg, Va., shown on the map. The company's right to apply the power of eminent domain in building this cut-off under the guise of two new branches, was questioned in the courts. The Supreme Court of Appeals of Virginia decided that the railroad did not have the power to condemn land for these two branches whose dominant purpose was to relieve traffic congestion, as construction of auxiliary sections of road for the purpose of relieving traffic congestion was not within the branching powers of the company. This decision necessitated the organization of the Lynchburg Belt Line & Connecting Railway Company to which the Norfolk & Western is to sell this cut-off line in consideration of the sum of \$2,748,785—its estimated cost—which is payable February 1, 1913, with interest at 5 per cent. from February 1, 1908. A trackage agreement is to be made with the Lynchburg company for use of its tracks. The cut-off, which is to be finished about the end of this calendar year, will be about 22 miles long.

President Johnson sums up the present railroad situation as it affects his property as follows:

"The policy of your management has been to supply adequate facilities

and sufficient equipment to move the business offered to your lines, as rapidly as the necessary funds could be secured from surplus income or through the sale of the company's securities. Notwithstanding its persistent efforts to that end, the expansion of industrial requirements has been so great as to prevent the complete realization of its wishes. The results obtained from your company's operations amply demonstrate the importance and value of the work already completed, and that the further construction, equipment and betterment work heretofore authorized and in progress is urgently needed to conduct economically the business offered to your company, which could fully employ all such facilities were they now completed and in use."

"The rapidly progressing development of the coal areas tributary to your lines makes it increasingly evident that the demands on your management for transportation cannot be properly met without complete double-tracking of the line from Concord, Va., to Columbus, Ohio, which will involve the construction of 150 miles of second track in addition to that already authorized, and such additional passing sidings and other facilities east of Concord and elsewhere, and such equipment as may be necessary to maintain the proper equilibrium in the carrying capacity of the system."

"This work, while important to the interests of the stockholders, is equally important to the welfare of the commonwealths traversed by your lines, and of their citizens who are striving to develop the natural wealth of their states and to broaden the market for their mineral and other products. It therefore goes without saying that any policy which hampers the development of the railroads, or by depleting their revenues lowers their credit and thus repels investors who would otherwise purchase their securities at fair prices, cannot but be fraught with disaster both to the states and to the roads. It is not believed that such a policy will commend itself to the dispassionate judgment of the communities served by your lines, or that in the effort to correct abuses that may exist, unjust treatment will be accorded to corporations that are honestly endeavoring to fulfil the purposes for which they were chartered. It is only 11 years since your railroad passed through a receivership and foreclosure and a drastic reorganization, and it certainly cannot be seriously claimed that the small dividends since paid to the shareholders have yielded even a just return on its capital. The owners of your property are entitled to the same good faith which is properly exacted from them, and no temporary prejudices or misunderstandings can excuse or justify action which would deprive a railroad shareholder of the rights and remedies which are guaranteed to all classes of the community. It was with this conviction and in the performance of a duty imposed upon your board of trustees for the shareholders, that it felt itself constrained to take the legal proceedings recently initiated in Virginia for the protection of your interests in connection with the proposed reduction of your rates on passenger traffic; and it is a matter of congratulation that with the concurrence of the representatives of the Commonwealth of Virginia, an arrangement was reached whereby a speedy determination can be had of the important questions at issue without, it is hoped, undue damage to your property."

The principal results of the last two years' operation are summed up in the following table:

	1907.	1906.
Mileage worked	1,876	1,853
Passenger earnings	\$4,163,119	\$3,598,558
Freight earnings	26,100,946	24,111,801
Gross earnings	31,164,381	28,487,706
Maint. way and structures	3,895,548	3,339,797
Maint. of equipment	5,239,890	4,749,832
Conducting transportation:		
Traffic	537,674	441,678
Operation	9,256,228	7,913,695
Operating expenses	19,514,536	17,064,624
Net earnings	11,649,846	11,423,142
Net income	7,000,319	7,452,375
For betterments and equipment	1,246,652	2,950,000
Surplus for the year	671,552	589,926

NEW PUBLICATIONS.

Electrical Engineering. By E. Rosenberg. Translated from the German by W. W. Haldane Gee and Carl Kinzbrunner. New York: John Wiley & Sons, 347 pages; 6 in. x 9 in.; 333 illustrations; cloth. \$2.00.

The book had its origin in a series of lectures delivered by the author, who is chief electrical engineer for the Messrs. Körting Bros. at Hanover, to the workmen and the staff associated with him, so that it is intended for readers of the same class who are interested in the subject but who have not had the advantages of a technical training. In accordance with this general plan the language used is exceedingly simple and readily understood, and the book is, to a great extent, free from mathematical formulae. In fact, they are only used after the theory of the subject in hand has been thoroughly explained. For this reason several matters have been dealt with very completely which, to the mathematically educated man could have been explained in a few lines. The book is exceedingly happy in its elucidation of the general principles with which it opens. It states the facts of the generation of the electric current by a simple galvanic cell, and follows it up consecutively until, if the text is followed carefully, the reader will have a clear idea of the magnetic field, of such instruments as the galvanometer, the solenoid, the ammeter, voltmeter, and of conductors and their insulation, by the end of the first chapter. Not such an idea, to be sure, as would enable a man to design any of these instruments but such that he would understand the principles of their action. Indeed this is what the book teaches. With dynamos and other electrical machines, the reader is taught the principles and mechanics of their construction, but no attempt is made to give information to enable a designer to calculate the wiring of a transformer for example. The scheme for the wiring of electrical machinery is exceedingly difficult to picture to the mind's eye, and here, as in other works of the kind, recourse is had to

diagrammatic representations of the windings and circuits, which are quite different in appearance from the actual machine, so that in this there is no attempt to make a workman, since this is not an instruction book of that sort, but the descriptions are such that an intelligent reader should be able to recognize general types at sight.

Illustrations are given throughout of types of machines made by different builders, but they are not described in detail as the author very sensibly says, in the preface, that such descriptions are readily accessible to interested parties in the business catalogues of the firms which are engaged in their exploitation.

As an example of the character of the work the method of handling the subject of alternating currents can be cited. The author shows how the alternating current is that produced by the earliest machines and cites a number of very simple experiments to illustrate its action and how in this it resembles the direct current, and yet how it differs therefrom, notably in the case of the illumination of the incandescent lamp. Then comes the effect in producing induction currents, followed by the details of the operation of these machines and that through more than a hundred pages of text with only four or five references to mathematical computations and then only after the principles of action had been fully explained. It must not be thought from this that the book is a popular discourse that utters much and says little. The text is clear, concise, consecutive in its arrangement, and requires close and concentrated attention for its proper comprehension. But, given this the careful reader will be repaid at the end by receiving a clear idea of ordinary electrical phenomena and the machinery by which those phenomena are produced and controlled.

CONTRIBUTIONS

Depreciation.

Baltimore, Md., Sept. 18, 1907.

TO THE EDITOR OF THE RAILROAD GAZETTE:

There are one or two points in connection with the establishment of depreciation rules for railroad property under the guidance of Mr. Henry C. Adams in charge of Statistics and Accounts for the Interstate Commerce Commission which seem eminently worthy of the widest discussion and consideration that can be given them.

So far as rules have been formulated, amounts appropriated

There is, however, such a thing as flogging a willing horse to death, and it may be that the establishment of renewal and depreciation funds for such items as ties and rails is going a little too far. That such funds have existed in certain directions in times past is true, but that they are absolutely necessary in the sense that they are so for the replacement of equipment is entirely dependent on the amount of money currently put into the track and included in operating expenses.

Consideration of the essential nature and properties of the articles on which accumulations are to be made seems necessary. A car is an entity complete in itself. A rail for any railroad purpose is not an entity. The track is the entity corresponding to the car. It is known from experience that a car undergoes a slow process of decline despite all the work that can be put on it until it reaches extinction and death, and at that last moment its value to the railroad vanishes, though up to that moment its value was practically as much as at the moment of its birth. Now against this catastrophe provision must be made by depreciation. But does this unavoidable process of gradual decay attach to the existence of a track? In the very nature of the case it would seem the answer must be in the negative for a gradually decaying track would put all the trains in the ditch and bring the whole machine to a standstill. Therefore it would appear that the railroads have been under the positive necessity of maintaining if not improving their tracks currently, and that being the case it seems necessary to establish a *raison d'être* for renewal and depreciation funds for ties and rails.

M. B. WILD,
Statistician, Baltimore & Ohio.

Steel Ties in Germany.

Osnabrück, Aug. 2, 1907.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the current volume of the *Organ für die Fortschritte des Eisenbahnuwesens*, p. 190, there appeared an article on "The Behavior of Steel Crossties," giving a brief report, taken from the *Railroad Gazette*, March 1, 1907, of the derailment of a train on Feb. 22 at Mineral Point on the Pennsylvania Railroad on an experimental section of track laid with steel ties. The report concludes with the statement that the committee appointed to investigate the accident was unable to determine with certainty the cause of the derailment, but suspected that at the point at which the derailment began some object had become wedged between the flange of one of the wheels and the rail, thus producing a violent lateral blow. As it was very cold at the time and the steel ties and



Fig. 1—Haarmann Steel Tie With Hook Plate Rail Fastening.

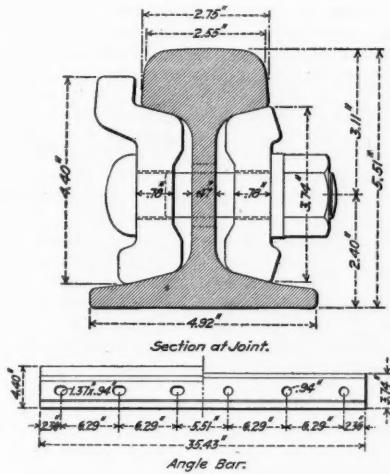
for depreciation are not to be spent in replacing the identical property for which the amounts were appropriated but may be used to replace property of the same kind. The language of Mr. Adams' circular is "an accumulation of engines A, B, C, D and E may be expended to replace engine F and need not be kept as a reserve until engine A or B or C or D or E goes out of service." A consideration of this language makes it evident that numerical replacement is not to be a governing principle in railroad depreciation and that provided accumulated moneys are expended in replacing property of the same kind as that on which the moneys were accumulated it matters not what the product of the expenditure shall be. From this it would appear that railroad managers can argue that if they have, for instance, accumulated \$800,000 and against that sum desire to retire one thousand 60,000-lb. cars from service they can spend the \$800,000 in the purchase of six hundred 100,000-lb. cars and still maintain the earning capacity of the equipment; for 30 tons multiplied by 1,000 equals 30,000 tons carrying capacity and 50 tons multiplied by 600 equals 30,000 tons carrying capacity. This is all right for the interests of the railroad and the very large shipper, but it evidently neglects the growing needs of the country as a whole except on the theory that interests are to be more and more consolidated and the number of independent small shippers, including the vast farming community, is to decrease. It is questionable, however, in view of present movements in every direction whether this is a sound view to take of future developments, and if it be not then provision should be made for numerical replacement of equipment and no larger number of cars retired from service than accumulated funds will purchase at current prices. This need not prevent the purchase of cars of larger capacity provided the price per car admits of it.

fastenings were rigid, this lateral blow caused a shearing of the bolts holding down the outer side of the outside rail. The committee, being of the opinion that if the ties had been of wood the resulting damage would have been less severe, it was decided to remove the 3,000 steel ties laid in that part of the track, replacing them with wooden ties.

While it is, of course, impossible for me, without having made a personal examination of the track, to offer a definite opinion as to the cause of derailment, still, having had a long and extensive experience in connection with metal tie superstructure, I venture to submit some information on the subject which may possibly be of interest to many of your readers.

When we began to use metal superstructure in Europe, we suffered many disappointments. It is not as easy as it appears to determine the proper shapes for metal ties and their fastenings. A superstructure equipped with them should have a greater capacity and a longer life than is obtained by the use of wooden ties. It was necessary to determine gradually by means of practical experiments and from the results of operation, those conditions which a metal tie must satisfy. As such are to be considered:

1. Sufficient area in contact with the ballast in order that the pressure on the ballast may not be excessive.
2. Sufficient carrying capacity and length, so that the pressure may be equally distributed.
3. Protection of the upper surface against friction and stresses for to guard against deformation and rupture.
4. Large surfaces of contact at points of attachment, to prevent rapid wear.
5. Relieving points of attachment from secondary strains, e. g., of bolts from side pressure or shearing strains, in order that they



86 lbs. per yd., is 411 lbs. The attachment of the rail to the tie is practically the same. Between the foot of the rail and the tie is placed the so-called hook plate or hook stud-plate mentioned above. These hook plates protect the upper surface of the tie against strains and friction, render a special securing of the outside of the rail by means of screw bolts unnecessary, and relieve the clampplate screws on the inside of the rail of all lateral stress. I should imagine that a similar construction would be of value for American conditions, with the possible change of substituting plates of uniform thickness, thus furnishing a horizontal supporting surface to suit the vertical position of the rail customary in America. This change is shown in Fig. 2. With this construction, shearing of screw bolts cannot easily occur, even from side lash occasioned by oscillation of the engine.

DR. ING. N.C. A. HAARMANN,
Geheimer Kommerzienrat.

The Work of the Cole Superheater.

Prof. W. F. M. Goss presented a paper before the Indianapolis meeting of the American Society of Mechanical Engineers, giving, in outline, the results of tests of the Cole superheater as applied to the locomotive in the testing laboratory of Purdue University.

For the purpose of observing performance, thermometers reading to 750 deg. F. were inserted in each of the two branch pipes extending between the superheater and cylinders, in the discharge side of all loops, six in number, the length of which varied from the normal, and in the upper loop of the right-hand upper flue, which loop is of normal length. All thermometers were in wells thoroughly jacketed by a current of steam flowing from the stream, the temperature of which was sought.

The results show that the degree of superheat in the steam delivered to cylinders is largely affected by the rate of evaporation. Thus in Fig. 1 the average degree of superheat as shown by readings taken from the two branch pipes is plotted against the rate

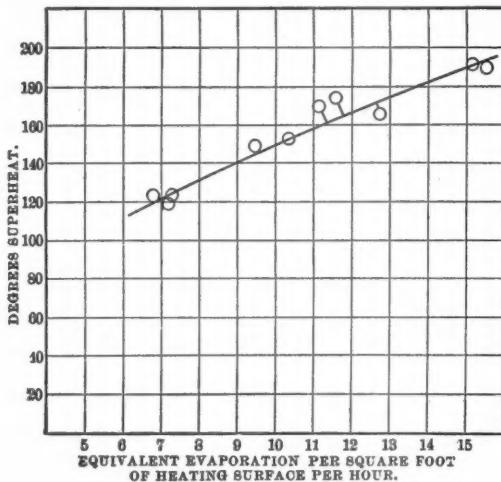


Fig. 1.

of evaporation. It shows that as the evaporation per square foot of heating surface per hour is increased from 7 lbs. to 15 lbs., the degree of superheat rises from 122 deg. to 188 deg. F., due doubtless to the fact that the superheating surface, as compared with the direct heating surface, absorbs a greater portion of the total heat as the rate of evaporation increases. For all tests represented upon this diagram each pound of steam delivered received from the direct heating surface approximately 1,160 B.t.u. and from the superheating surface from 70 to 104 B.t.u. depending upon the rate of power at which the boiler was worked.

Another expression of the fact to which attention has already been called is well set forth by Fig. 2 which shows the per cent. of the total heat taken up by the water and steam which is absorbed by the superheater, plotted in terms of smoke-box temperature. It will be seen that as the temperature of the smoke-box changes from 600 deg. F. to 800 deg. F., the heat absorbed by the superheater rises from 5.6 per cent. to 8.5 per cent. of the total taken up by the water and steam.

The degree of superheating obtained from loops of different lengths is shown graphically by Fig. 3. It will be seen that the amount of superheating obtained increases rapidly as the loop is increased in length. This results from the fact that each increment in the length of the loop carries the superheating element nearer the firebox and serves to increase the average temperature to which the whole loop is exposed. The effect therefore is two-fold; first, that resulting from an increase of superheating surface, and second, that resulting from an exposure of that surface to a

higher average temperature. The basis for these observations (Fig. 3) was supplied by the superheating loops arranged in three flues making up a portion of the left-hand vertical row. The lower loops in those flues were, respectively, 80 in., 92 in. and 105 in., while the upper loops were, respectively, 71 in., 84 in. and 96 in. A review of the plotted points at once discloses the fact that a higher degree of superheating is obtained from the lower loop of a given length than is possible from an upper loop of the same or even greater length. Comparing results as obtained, it appears

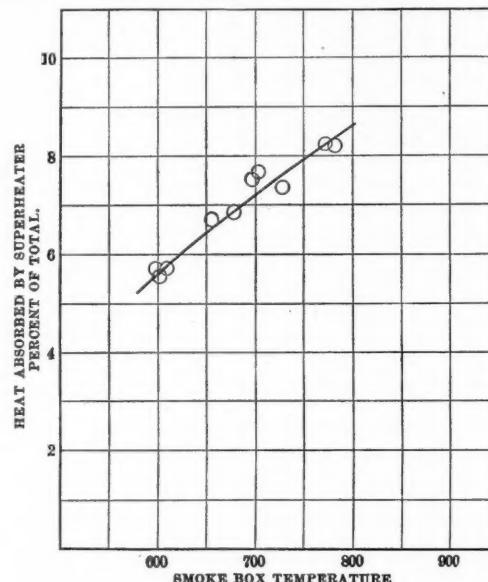


Fig. 2.

that the lower loop in a given flue, while but a few inches longer than the upper loop, gives from 25 to 30 per cent. more superheating effect. This probably is to be accepted as a measure of the advantages which come to that element of the superheating surface which is first to receive the flow of the current of moving gases, though it is not impossible that the lower loop may claim some advantages from its position in the flue.

It has been observed that the average temperature of the steam in the two branch pipes is always less than the calculated temperature, assuming all superheating loops to give the same performance as those which are under observation. A reason for this must be

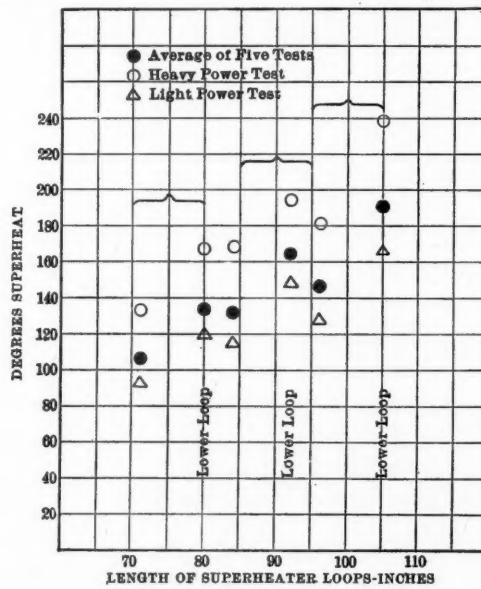


Fig. 3.

found in the difference in the volume or quality of the furnace gases transmitted by the several flues.

CYLINDER PERFORMANCE.

While a full analysis of the cylinder performance of the locomotive must be reserved for another time, it is proper here to note that when served with saturated steam (locomotive "Schenectady No. 2"), its performance under normal condition of running was represented by a range of from 24 to 27 lbs. of steam per indicated

horse-power hour. After being equipped with a superheater, substantially the same locomotive ("Schenectady No. 3") delivers under ordinary conditions of running an indicated horse-power upon the consumption of from 20 to 22 lbs. of superheated steam per hour, a difference of about 17 per cent.

New York State Accident Reports.

The New York state Public Service Commission for the Second district has sent to the railroad and street railroad corporations of the state a circular containing regulations governing the reporting of railroad accidents, in accordance with the Public Service Commissions law. Telegraphic reports will be required, to enable the Commission to make prompt investigation of any accident which is of sufficient importance to require it. Railroads are requested also to report by telegraph any accident not covered in the official list which, in their opinion, is serious enough to justify investigation by a state inspector. The circular says that the directions for reporting accidents by mail are formulated for the purpose of securing data covering the details and causes of all accidents so that the records kept by this Commission may be as comprehensive and valuable as possible.

"The Commission aims to make its investigations as thorough as possible with a view to the prevention of accidents in the future, and to that end the cordial co-operation of railroad officials is requested."

The classes of accidents which must be reported by telegraph are: (a) All resulting in loss of life to passengers or employees. (b) All occurring at grade crossings resulting in death or serious

the omission of this detail definition. In place of it the class of accident is indicated by letters at the top of the sheet.

The Station Agent.*

Following the rumor that the railroad operators might support the commercial men, by a sympathetic strike, I traveled to a small station, on a branch line, and found a man who seemed to be a sort of railroad Pool Bah, a combination of operator, freight handler and station agent. He was about forty years of age, and looked discontented. To open conversation I inquired how long he had been in the business.

"Twenty years; ever since I was young," was his answer.

"And what," I asked, "are your chances of promotion?"

"Look at me and you'll see what they are," he replied, bitterly. "I'm paid the vast sum of \$60 a month—don't faint at the princely figure! And I'd expect an earthquake about as soon as a raise."

"Do you think opportunities are better in other lines?" I questioned.

"I think any other job under the sun is better than mine," was his pessimistic response; whereupon I naturally inquired why he did not go elsewhere.

"Why? Because I'm a fool, I suppose. The trouble with me is that I'm too good. I've got a long, clean record with the company, and I'm always hoping that some day they'll remember I'm in existence and give me a shove up. You know we always hope, even when we're dead sure it's no use. Then I've put in the best part of my life. It isn't easy to change, at my age; and I've got a family to support. That's just where they've got me."

Questioned about his family, he said, "I have a wife and two little girls. I can tell you it keeps us hustling to make ends meet on my pay. We got along all right before the children came, but it's hard scrabbling now."

"Do you get your house free?" I asked. It was so close that it appeared to stand on railroad ground.

He broke into a laugh. "Say, you must take this company for a sort of benevolent society. All I get is my little sixty per. You see," he explained, "I don't rank as a station agent; this is only a branch of the main depot. I'm really an operator, and just do other odd jobs for the company—to show there's no ill-will. The reason I live so near is so that I can run home if there is a slack time, and there often is; or my wife can leave the children here when she has to go out."

Remarking upon his apparent abundance of leisure, I asked whether he read much.

"Yes," he replied, "I do; but mostly light stuff. I used to care for better reading, but I've gone down hill. The railroad takes the heart and ambition out of a man and he gets so he just puts his time in. I have too much idle time, and that's the worst thing could happen a fellow. I know I'm not up to much. I've got fat and lazy and I just jog along and keep rules so I won't get 'jacked up.' I have a good record, and I keep it good; but I confess I'm not the ambitious man I once was."

"But," I protested, "many railroad men do get to the top."

He shook his head. "Only a few," he insisted. "Most of the top men get up by 'pull,' they don't work up. Of course operators can get to be despatchers, but only one in a mighty lot of them ever gets there, or ever can. And for those who do, it's a ticklish job; any time you may give a wrong order and have an accident, and then you're down again. I haven't got any boy to worry over, but if I had I'd never put him into railroading, if there wasn't another job left on the face of the earth."

"You can see what my life is," he went on. "Every day is just like every other day. For amusement I go to the theatre once in a while, when I can afford it—which isn't often. Then I'm a Mason and I attend lodge. That is a sort of a pleasure, but it is also a family duty. I joined the Masons because they are the best people in the world to look after your folks if anything happens you."

"What about belonging to your union?" I asked.

"Oh, I know there is one," he answered. "But I've never joined it; never had any money to pay the dues. It isn't strong enough to do anything, anyway. If it ever gets strong enough to raise wages I'll join. Just now it stands me in better with the company not to be in it."

"And, of course, you expect to strengthen it by keeping out," I remarked.

"I ain't thinking or caring anything about it," was his reply. "I've got enough to do to look out for number one. If they want me to join they've got to get busy and show me something in it for myself."

I glanced around the stuffy station and at the tiny cottage. I thought of the wife and children and of the \$60 a month. Then I looked at the man of forty, in whom ambition and hope were almost dead. "After all," I suggested, "you do not seem exactly jubilant over what you have done, so far, for 'number one'."

"No," he confessed. "Still, I'm always hoping the company

*From an article in the *Independent* by Lydia K. Commander.

FORM NO. 26																																																						
TO THE PUBLIC SERVICE COMMISSION, SECOND DISTRICT, STATE OF NEW YORK																																																						
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Estimated damage to cars, engines, track, bridges and signals. \$																																																						
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New York State Accident Report Blank.

Reduced one-half.

injury to any person. (c) All derailments of passenger trains, or of locomotives or cars in passenger trains. This does not apply to minor derailments of electric cars on city or village streets. (d) All collisions involving freight or passenger trains, whether resulting in loss of life or not. (e) All explosions of locomotive boilers; and all accidents to locomotive boilers resulting in death or serious injury to any person. (f) All bridge failures.

Every accident must be reported by mail immediately after the circumstances attending the accident shall have been ascertained.

Accidents to employees in repair shops, construction shops, or other places remote from the railroad are to be omitted (the same as in the Federal monthly reports); and the principal regulations concerning the details of the reports are nearly or quite like those prescribed by the Interstate Commerce Commission. Where a man is injured in coupling or uncoupling cars, and he is between the ends of cars, or between a car and an engine, or between two engines, the report must show why he was there.

Form 25, the blank prepared by the Commission, is 8 in. x 10½ in. We give a reduced facsimile of its printed part. The note referred to after the word "Accident" reads:

After the word "Accident," state whether collision; derailment; parting of trains; locomotive or cars breaking down; falling from train, locomotive or car; jumping on or off train, locomotive or car; struck by train, locomotive or car; struck by overhead obstruction; contact with trolley or feed wire; contact with third rail; boiler explosion; failure of bridge; or other cause definitely specified.

It will be seen that this follows closely the forms in use by the Interstate Commerce Commission. These latter differ chiefly in

will think of me some day; and I don't want to do anything to get it down on me. No union, and no strikes for me. I'm loyal to the company that pays me."

Just then the sound of an approaching train was heard, and I left the agent-operator to another interval of business.

The next man I interviewed was a vigorous, alert-looking chap of about twenty-four, who, as I soon discovered, was something of a stolic and a philosopher. He was the night operator in an office where several roads came together, and there was a great deal of transference of freight cars from one line to another.

"How is it that you are so well and strong, when you work at night?" I asked him.

"I am quite a 'physical culture crank,'" he replied. "This is a hard place, and I found, a few years ago, that I was in for a break-down if I didn't look out; so I started on a course of training. I walk several miles every day, as well as riding a wheel, and I usually eat only one meal—though that's a big one."

I'll be made a despatcher, with \$120 a month. That's the top, for an operator. But it's a hard, driving life that plays out the nerves before middle age. When the strike comes I'm going to quit for good and go out West and see the world."

Ganz Steam Motor Car for the Intercolonial.

The Railway Auto Car Co., New York, has just delivered to the Intercolonial Railway of Canada a 120-h.p. steam motor car of the Ganz type. This car was imported direct from the Buda Pesta works of Ganz & Co. The car has seats for 40 passengers, including eight in a smoking compartment. A baggage room 7 ft. long is also provided. At the forward end of the car is a compartment 7 ft. long which contains the steam generator, control levers and all accessory apparatus. The rear end of the car is vestibuled. The body of the car is of steel and the interior is handsomely finished in hard wood with the seats upholstered in leather. It is heated by steam and lighted by acetylene gas.

The car is propelled by a 120-h.p. steam motor which is mounted in the forward truck and drives on the rear axle. This motor is of the Ganz enclosed type and the working parts run in an oil bath to insure continuous and perfect lubrication. The steam generator, which is mounted in the motorman's compartment, is of light and compact construction, being only 42 in. in diameter and about 4 ft. high. Its construction is such that all parts in contact with fire and water can be quickly exposed for cleaning and repairs.

Before this car was accepted by the Intercolonial a number of severe trials were made. The official test was from Moncton to Harcourt and return, 75 miles. The run from Moncton to Harcourt, 37 miles, was made in 62 minutes, or at the rate of about 37 miles an hour. The maximum speed was 43 miles an hour. The total coal burned in the 75 miles was 925 lbs., which is equivalent to 12.3 lbs. per mile. The guarantee called for 16½ lbs.

per mile so that a better performance by 4.2 lbs. than that guaranteed was obtained. On a 1 per cent. grade one mile long from Moncton to Berry Mills a speed of 30 miles an hour was obtained. In another test over a distance of 26 miles the car hauled a trailer car weighing 24 tons at an average speed for the 26 miles of 31 miles an hour.

The First Year of the Simplon Tunnel.

The Simplon tunnel was opened to regular service on June 1, 1906. The results of the first year of operation are given as follows in the Swiss *Bulletin Technique*:

The shipments have amounted to 27,400 metric tons into Italy and 29,400 tons into Switzerland, or a total of 56,800 tons carried, which includes that sent into Italy from France by way of Switzerland and vice versa. The traffic is very light, either because the route is new and not well known or because, with rates the same, it does not present sufficient advantages, as compared with the Mont Cenis route, to attract business. Of the traffic so obtained about 50,000 tons was destined for delivery in Switzerland or the valley of Ossola. The figures are represented as being comparatively high for the opening, for a maximum estimate of 100,000 tons had been made, based upon the traffic sent through the Simplon during the first years of its exploitation, and it is expected that these figures will be reached during the second year of operation.

The total number of passengers carried during the year cannot be accurately stated as yet, but it is estimated to have been about 430,000 in the two directions.

In estimating the receipts, they are based upon the average rates of the Federation railroads, and they are placed at the gross sum of 42,000 francs per kilometer (about \$16,800 per mile) for the main tunnel. It is to be noted, however, that this income of 42,000 fr. per kilometer is obtained by applying, to both passengers and freight, double the rates received in 1905 by the Federation railroads, and if the Simplon rates of 8.05 centimes per ton for freight and 3.77 centimes per kilometer for passengers were to be applied the receipts would drop to 20,758 francs. This sum, therefore, represents but half the traffic that will be required before the 42,000 francs will actually be reached, so that the report of the traffic is, to a certain extent, illusory. With the actual receipts per kilometer between Brigue and Domodossola as they are, there still remains a large margin to be made up before the 50,000 francs receipts per kilometer will be reached, at which time the second track is to be laid in the tunnel.

Ganz Steam Motor Car; Intercolonial Railway.

This sounded like a strenuous day programme, for a man who had to work all night, so I asked when he did his sleeping.

"I sleep a good deal at night," he explained. "After twelve there is a slack time, and I screw up the sounder till it sounds good and loud; then I shade the lights and go to sleep. If my station is called it wakes me, just as it would if someone called my name. Often, before I get thoroughly awake, I will have hold of the key and be sending an answer. I've got a name up and down the line for never being caught napping. Yet I sleep as much as any of the night fellows; and they all do it."

Dropping personal questions, I asked, "What do you consider the good points and the bad of your business?"

His answer was ready—"The good is that the pay car comes regularly and your boss is a long way off, you are not always being nagged. You can do your work very much in your own way, so long as you get it done well. The bad is that there is no encouragement for enterprise. I have made a number of improvements that have been adopted by the management and introduced all over the system, but I have received no recognition. Again, we have to work twelve hours a day, every day in the year. If I get a day off, after seven years service, I lose my pay. Worst of all, you never have a record that stands good. A fellow was fired recently who had been with the company for ten years, and had a spotless record; yet he only broke a silly little rule, that nobody really ever does keep. He was a straight, steady chap who had never been suspended in his life."

"What do men get suspended for?" I asked.

"For punishment. Generally you get laid off for periods of from two days up to a month. I have known men who were laid off for ninety days for a very serious trouble."

"So that is how the company punishes you men," I commented. "Now, how do you punish it?"

He looked up quickly, then laughed. "It never works that way," he said. "At least it never has yet. But you know there's a big strike coming, and we may be in it before it's over. We've got to go through that stage some time. Every union has to strike, until it gets so powerful that it doesn't have to. I think union labor is the finest force in America to-day. It dared to stand up to the trusts, long before Hughes or Roosevelt ever thought of going against them. Our union is only struggling yet, but it's bound to get power some day."

Before we parted I asked, "What future do you expect for yourself?"

"None, from the railroad," he replied. "I have the promise that

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"I sleep a good deal at night," he explained. "After twelve there is a slack time, and I screw up the sounder till it sounds good and loud; then I shade the lights and go to sleep. If my station is called it wakes me, just as it would if someone called my name. Often, before I get thoroughly awake, I will have hold of the key and be sending an answer. I've got a name up and down the line for never being caught napping. Yet I sleep as much as any of the night fellows; and they all do it."

Dropping personal questions, I asked, "What do you consider the good points and the bad of your business?"

His answer was ready—"The good is that the pay car comes regularly and your boss is a long way off, you are not always being nagged. You can do your work very much in your own way, so long as you get it done well. The bad is that there is no encouragement for enterprise. I have made a number of improvements that have been adopted by the management and introduced all over the system, but I have received no recognition. Again, we have to work twelve hours a day, every day in the year. If I get a day off, after seven years service, I lose my pay. Worst of all, you never have a record that stands good. A fellow was fired recently who had been with the company for ten years, and had a spotless record; yet he only broke a silly little rule, that nobody really ever does keep. He was a straight, steady chap who had never been suspended in his life."

"What do men get suspended for?" I asked.

"For punishment. Generally you get laid off for periods of from two days up to a month. I have known men who were laid off for ninety days for a very serious trouble."

"So that is how the company punishes you men," I commented. "Now, how do you punish it?"

He looked up quickly, then laughed. "It never works that way," he said. "At least it never has yet. But you know there's a big strike coming, and we may be in it before it's over. We've got to go through that stage some time. Every union has to strike, until it gets so powerful that it doesn't have to. I think union labor is the finest force in America to-day. It dared to stand up to the trusts, long before Hughes or Roosevelt ever thought of going against them. Our union is only struggling yet, but it's bound to get power some day."

Before we parted I asked, "What future do you expect for yourself?"

"None, from the railroad," he replied. "I have the promise that

The Use of Superheated Steam on Locomotives in the United States and Canada.*

Aside from an experimental application of a smoke-box superheater on the Chicago, Burlington & Quincy, between 1870 and 1874, the first application of superheated steam in North America was made by Roger Atkinson, then mechanical superintendent of the Canadian Pacific, who applied a "Schmidt" smoke-box superheater to a 4-6-0 simple freight engine in 1901. In 1903 E. A. Williams, then mechanical superintendent of the same road, applied a "Schmidt" smoke-tube superheater to two 4-6-0 compound freight engines, and the results obtained from these installations were exceedingly satisfactory, the first engine showing a saving of 25 per cent. over corresponding simple engines and 18 per cent. over corresponding compound engines of the same class, while the latter engines showed a saving of from 15 per cent. to 20 per cent. over similar compound engines using saturated steam.

In 1904 the New York Central applied a "Cole-Field" smoke-tube superheater to a 4-4-2 passenger engine, and in the latter part of the same year the Canadian Pacific bought 41 engines, 21 of which were equipped with this type of superheater, and 20 with the "Schmidt" smoke-tube superheater. Since that date all engines, other than those in switching service, built for the Canadian Pacific have been equipped with smoke-tube superheaters of various types, and on December 31, 1906, there were in service on this road 197 engines equipped with superheaters of the following types:

Type.	Number.
Schmidt smokebox.	1
Schmidt smoketube.	32
Cole-Field tube.	21
Cole return bend	55
Vaughan-Horsey return bend.	88

At the present time this road has on order 175 locomotives for delivery during the present year, all of which are to be equipped with the "Vaughan-Horsey" type of superheater, which will make a total of 372 engines to which this principle has been applied.

On the railroads in the United States the progress has been far less rapid, and a reasonably complete list of the engines equipped at the end of 1906 is as follows:

Railroad.	Cole.	Schmidt.	Vaughan-Horsey.	Total.
N. Y. C. & H. R.	1	2	..	1
C. B. & Q.	1	..	..	3
Rock Island	6	..	..	6
M. St. Paul & S. S. M.	1	..	..	1
C. & N.W.	1	..	..	1
Boston & Maine	1	..	..	1
L. S. & M. S.	1	..	1	2
Totals	12	2	1	15

With the exception of one engine, viz., the first to which a superheater was applied on the Canadian Pacific Railway, all the engines enumerated above have been equipped with superheaters of the type known as the smoke-tube, this particular engine being equipped with a superheater of the smoke-box type. The Baldwin Locomotive Works has also built a few locomotives equipped with the Baldwin smoke-box superheater. One of these is exhibited at the Jamestown Exposition and was described in the *Railroad Gazette*, June 7, 1907.

The Best Fuel for the Blacksmith Shop.

At the recent convention of the Master Blacksmiths' Association a paper was presented on the best fuel for the blacksmith shop, by J. G. Jordan, of the Texas & New Orleans, who is located at Houston, Tex. Experience of a good many years leads the author to recommend oil for heating and for furnace work, provided the furnace is so made that the oil will not come in contact with the iron while it is being heated. This fuel has been used upon the Texas & New Orleans for making all driving axles, and only one has ever broken, and that was due to over-heating; this with axles, some of which finish 11 in. in diameter. The advantages of oil are that it heats more rapidly than coal, so that the output is increased by its use, besides which it appears that iron will not break, when being bent, so easily when it has been heated with oil as it will when coal is used. In this connection it should be noted that oil can only be used in furnaces or in furnace-like boxes where the blaze is confined. With proper arrangements of this kind, however, it is possible to weld locomotive frames and straighten almost any iron on a car or engine without removing it, and thus avoid the expense of such a removal.

As for cost, if oil can be bought for not more than 4 cents a gallon and coal costs from \$4.50 to \$5 per ton, oil will be the cheaper fuel to use, as the output in work will be sufficient to cover the difference in price.

As for cost, if oil can be bought for not more than 4 cents a blacksmith fire. For this purpose good coal is the best, and bad coal is no fuel at all. The troubles with low-grade coal are also increased by the receipt of successive shipments from different

*Extract from a paper by H. H. Vaughan, Assistant to the Vice-President, Canadian Pacific, presented at the Indianapolis meeting of the American Society of Mechanical Engineers, May, 1907.

mines, and when the coal is very bad the difficulties are unending. In fact, in one shop there has been so much annoyance caused by inferior coal that a record is kept of all work done with it, and it is reported as having been executed with bad coal as a protection to the workman. An example of an analysis of coal that is unsuited for blacksmith work is given as follows:

Moisture	5.70 per cent.
Volatile matter	18.21 "
Fixed carbon	43.80 "
Ash	27.89 "
Sulphur	4.40 "

With such a coal as that frames cannot be welded, and wherever there is an attempt to use it there will be constant complaint that iron cannot be welded with it, much less steel. It contains too large a percentage of sulphur and ash and not enough fixed carbon to make a coal fit for blacksmith use.

In contrast with this, coal should be bought on specifications, and these should be based upon the following requirements:

Sulphur	1.00 per cent.
Fixed carbon, not less than	70.00 "
Moisture, not more than	1.20 "
Ash, not more than	7.00 "

Finally, the best coal that can be bought will be found to be the cheapest in the end.

In the discussion it was asserted that the best coal for blacksmith work is the Blasbur coal. It is a Pennsylvania coal, and its fire can be made to last for five hours with very little cleaning. It makes a good coke, heats clean and causes very little waste to the iron. Another coal that was highly recommended was the Piedmont from West Virginia. This coal produces very little ash, and there is no difficulty in keeping a clean fire.

On the other hand, the Tennessee coal was criticised as being decidedly poor. The fire must be cleaned for almost every alternate heat, and there is always a delay in consequence. The coke is too soft and too light for heavy work and is not worth much. For bad coal it is necessary to have a hard coke and break it up fine.

One speaker recommended gas fumes as best adapted for a tool dresser's furnace.

Seth Wilmarth's Locomotives.

BY C. H. CARUTHERS.

In reading the early history of the steam locomotive and of locomotive construction one discovers the names of numerous builders who for a time turned out creditable machines and then closed their plants. In some instances these firms soon engaged in other lines of business, but often the closing was final, and after these years it is even more difficult to obtain much reliable data concerning either the personnel of the firms than of the locomotives which they built.

The "Union Works," of Seth Wilmarth, once existing in Boston, Mass., is one of these plants of long ago, of which many of the younger railroad men have probably never heard, and which has become but a shadowy memory to the "old-timers" yet living, although in its day some of the engines bearing its badge-plates were very familiar objects on a number of the leading railroads, and several were of decidedly original types, although these features were attributable to the selection of Mr. Wilmarth as a builder by their designers, rather than to his own inventive genius.

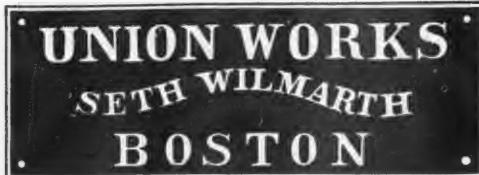
The plant was located on Foundry street, in South Boston, and might be called an off-shoot of the Hinkley & Drury (afterward Hinkley, Williams & Co.) works in which Mr. Wilmarth had previously been engaged, and it is not surprising, therefore, to find the engines of the Union Works very similar in many respects to those of the Hinkley shops.

As nearly as can be determined from the records of dates of construction which have been preserved, the first Wilmarth locomotives came out in 1849 and the last about 1853. Machine tools were also made in the same works, but no existing data seems available to determine whether this feature was continued after locomotive building ceased.

The first authentic record of Wilmarth locomotives appears to be the construction of three for passenger service on the Boston & Worcester Railroad in 1849. These engines were known as "Shanghais," though why, I cannot clearly discover from the various reasons which have been assigned, and had cylinders of 14 in. diameter and 18 in. stroke; driving wheels, 66 in. in diameter; boiler, 46 in. diameter; weight, about 50,000 lbs. The tender was carried on a four-wheel truck similar to those used by Norris at that time. The tracing from which the accompanying illustration is taken was made about eight years ago from a photograph of one of these engines, the "Fury," in possession of an official of the Boston & Albany, who kindly loaned it for the purpose. From this cut it will be seen that the engine is of the inside-connected type, and had double-steam chests, one of each pair containing the cut-off valves which were worked by hooks, most probably of the type illustrated in the *Railroad Gazette* of August 17, 1906, Fig. 6, page 142, although the

owner of the photograph is inclined to think a variable cut-off was used of the type shown in Fig. 5, page 147, in the same issue. As the variable cut-off does not appear to have been used on any road much before 1852 or 1853, it is possible that if the "Fury" had it, it was put on at a later period of the engine's service. It is a matter of regret that the photograph referred to does not show this feature clearly, but as the valve-gear with half-stroke cut-off and drop hooks was used by Hinkley at that time, it is almost certain that this form was used on the "Fury" at first.

Four freight engines and two more for passenger service were also built by Wilmarth for the same road. These passenger engines were somewhat larger than the "Fury" and were built on lines of greater originality, but the freight engines are said to have followed the design of the Hinkley machines very closely.



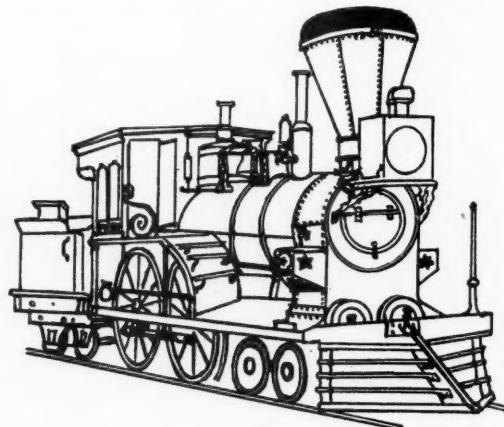
Seth Wilmarth Badge-Plate.

One engine at least was built for the Eastern Railway with two pairs of driving wheels between the firebox and cylinders, a four-wheel truck at the front end and another under the foot-plate; or, as we would now say, a 4-4-4 engine. Another of this class was built for the Old Colony Railroad. Sufficient authentic data has not been available to enable the writer to state positively whether the last eight engines referred to were inside or outside connected, but indications point strongly to inside connections.

A number of passenger engines with outside cylinders and 78-in. drivers were afterward built at these works for the Hudson River Railroad. It is very probable that these engines were of the same general design as two furnished the Pennsylvania about the same time and hereinafter described.

The "Pioneer" was built for the Cumberland Valley Railroad

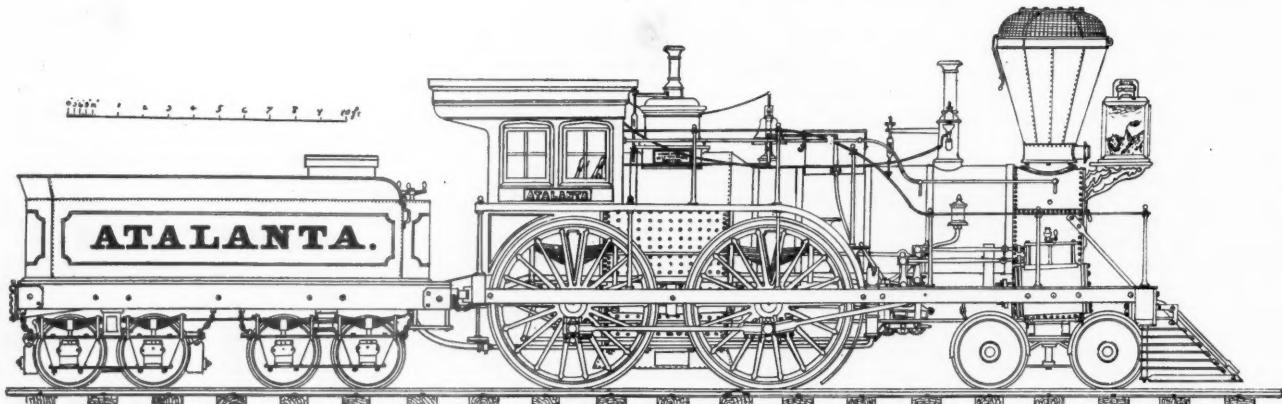
in 1851, and was small and of light construction in every way, even for that early period. It had 9 x 14 in. cylinders, 54-in. drivers, 30-in. leading wheels and 30-in. trailing wheels. Its weight was 26,000 lbs., with about 12,000 lbs. of this on the drivers. It is fitted with Stephenson link motion, and although the present officials of the road seem to think it was built thus, I cannot but think that "D" or "V" hooks were used originally and the links substituted in later years. The short tender, with a 600-gallon water cistern, is



Boston & Worcester Engine "Fury."

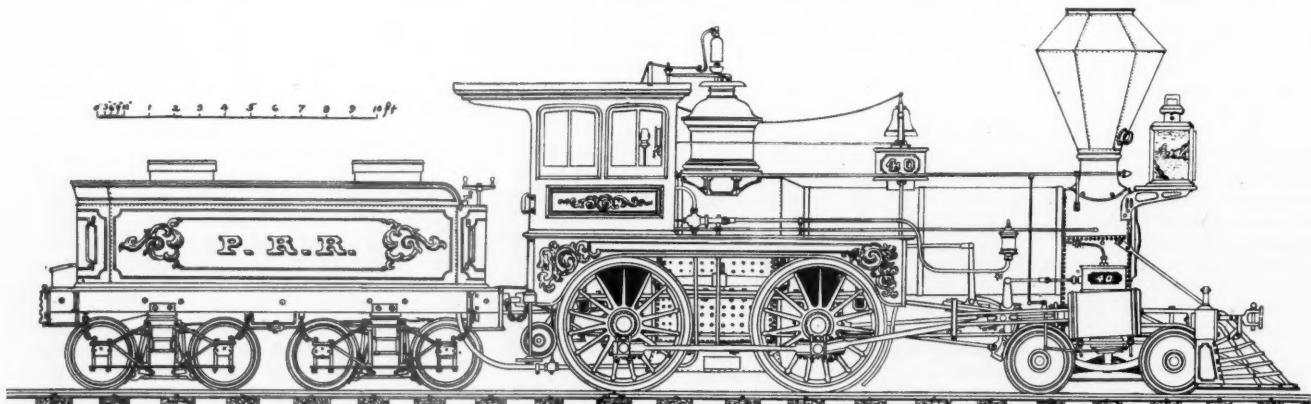
Built by Seth Wilmarth in 1949. Cylinders, 15 in. x 18 in.; drivers, 66 in.; boiler, diameter, 48 in.

placed on an extension of the engine frame behind the cab, and the roof of the latter is also carried back over it, and is provided with canvas curtains at the sides. The sandbox, as shown, was on the engine previous to the St. Louis Exposition, but does not appear in a half-tone from a photograph taken at that place. The steam-chest covers are on the sides of the chests, and the pump is under the foot-plate and is driven by an eccentric on the main axle. The dome is small and is covered by the cab. During the



Pennsylvania Engine "Atalanta."

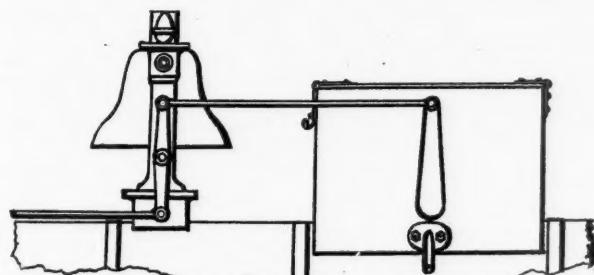
Built by Seth Wilmarth in November, 1852. Wood burner. Weight, total, 59,000 lbs.; weight on drivers, 35,900 lbs.; cylinders, 16 in. x 22 in.; drivers, 78 in.



The "Atalanta" as Rebuilt at Altoona in 1865.

Fitted to burn coal instead of wood. Weight, total, about 62,000 lbs.; weight on drivers, about 38,000 lbs.; cylinders, 16 in. x 22 in.; drivers, 60 in. Scrapped in 1870.

Civil War the cavalry of the Confederate army, under command of General Stuart, raided and burned Chambersburg on July 30, 1864, and included in the property destroyed were the shops and roundhouse of the Cumberland Valley Railroad, but the "Pioneer" fortunately escaped this fire, which damaged some of the company's other engines, as it was then in service and was run to a place of safety. The last time it was run under its own steam was on October 22, 1901, when it was fired up and run by General Foreman J. L. Lawrence out of Chambersburg with the intention of exhibiting it in operation at Carlisle, Pa., during the continuance of a sesquicentennial celebration at that place, but when within about one mile of the town a flue burst and the engine had to be "assisted" into a siding by the track repairmen. It afterward was taken back to



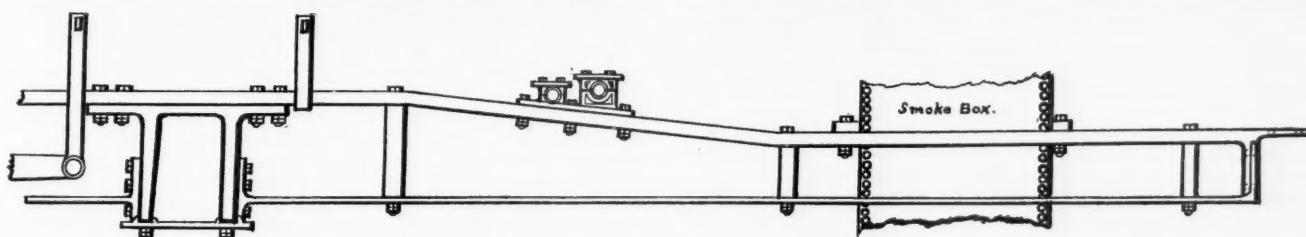
Sandbox, Rod and Connections; "Fury" and Other Engines.

Master Mechanic of the company. No further mention of them will be made in connection with this article, except to state that the last one passed into the hands of a junk dealer in 1886, and was doubtless cut up.

Three Wilmarths, named "Antelope," "Atalanta" and "Eagle," were built for the Pennsylvania in 1852-3. All had 16 x 22 in. cylinders; the "Antelope" and "Atalanta" had 78-in. driving wheels, and the total weight ranged from 55,800 to 61,300 lbs., and that on the drivers from 35,900 to 37,900 lbs. The "Eagle" only had 66-in. drivers, otherwise the engines were uniform in design. Considerable trouble appears to have been experienced with the first two before their service became satisfactory, and this in connection with two serious accidents to one of them caused by running into obstructions on the line at night, gave them an unsavory reputation with the men. Eventually the 78-in. wheels were removed and others of 66-in. diameter were substituted. The safety-valves were all at a later day placed on the dome, and a plain column with the whistle on its top replaced the combined safety-valve and whistle-column shown in the line drawing of "Atalanta" as originally built.



*Whistle Stand and Whistle.
Substituted in later years for
the combined safety valve and
whistle column shown on the "Atalanta" as originally built.*

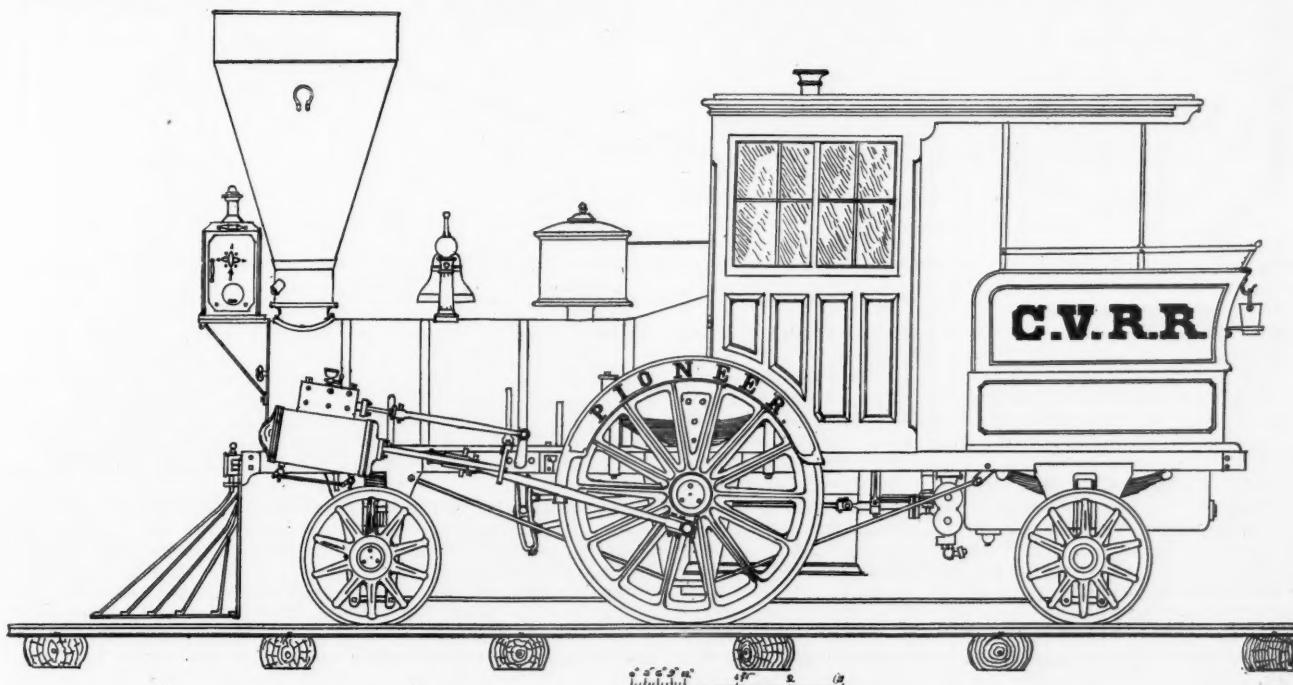


Frame of Later Wilmarth Engines.

Chambersburg, where it remained until shortly before the opening of the St. Louis Exposition, when it was sent there, and after the close of that show was taken with another ancient locomotive to form part of a museum contemplated by, or under the auspices of, the Baltimore & Ohio, if I have been correctly informed. This museum, however, is either yet in the "proposed" state, or has been abandoned, and the "Pioneer" is lying in a roundhouse at Martinsburg, W. Va., awaiting developments.

In 1852 two Wilmarth engines of the "compensated" type were built for the Cumberland Valley from designs by Alba Smith, the

"lanta" and also in that of the "Fury." The peculiar connection to the sand-valves was also replaced by a straight rod. In 1865 "Atalanta," which by that time was known as No. 40, was partly rebuilt at Altoona shops, as shown in the line drawing. The firebox was arranged to burn bituminous coal, Sellers injectors replaced the pumps, shifting links took the place of the hooks, the outside frames were taken off and other minor changes made as will be evident from an inspection of the two drawings. In this rebuilt form the engine continued in passenger service until 1870, when it was cut up. Its rebuilt appearance as shown is decidedly neat.



Cumberland Valley Engine "Pioneer."

One of three "Shanghais" built by Seth Wilmarth in 1871. Weight, 26,000 lbs.; cylinders, 9 in. x 14 in.; drivers, 54 in.; tank capacity, 600 gals.

The "Antelope" and "Eagle" were transferred in 1865 to the Philadelphia & Erie division, where they rendered several years' service before going the way of the "Atalanta."

Since boyhood I have heard rather vague statements from some of the older men on different divisions of the road, which when put together imply that a fourth Wilmarth was built for the Pennsylvania Railroad Company, but was lost overboard in its passage from Boston to Philadelphia by vessel and was never recovered. In one instance this story named a Smith & Perkins engine as the derelict, but if correct at all the conditions of those days would rather indicate the Wilmarth engine as the "missing link." The most authentic data at my command is a distinct remembrance that an extra tender used on the Pittsburgh division between 1853 and 1860 was often referred to in my presence during boyhood as having belonged to an engine which was lost at sea.

In this connection mention might be made of another engine owned by the Cumberland Valley, which was named "Jenny Lind," and was an almost exact counterpart of the "Pioneer," but bore a badge plate, naming the C. V. R. R. Co. as builder and the date of 1878. From various "earmarks" I believed this engine to have also been a Wilmarth, rebuilt at the time named on the plate, but the company's officials are positive that this is not the case. The "Jenny Lind" differed only from the "Pioneer" in having a longer rear extension of the frame, with a sort of observation room or car for the use of officials built on it and a four-wheel truck underneath. This engine was only cut up within the last two years.

The confirmation of much of the foregoing data is due to the courtesy of M. N. Forney, J. Snowden Bell, Esq., W. H. Taft and various officials and employees of the Pennsylvania and Cumberland Valley railroads.

The Portland & Seattle Railway.

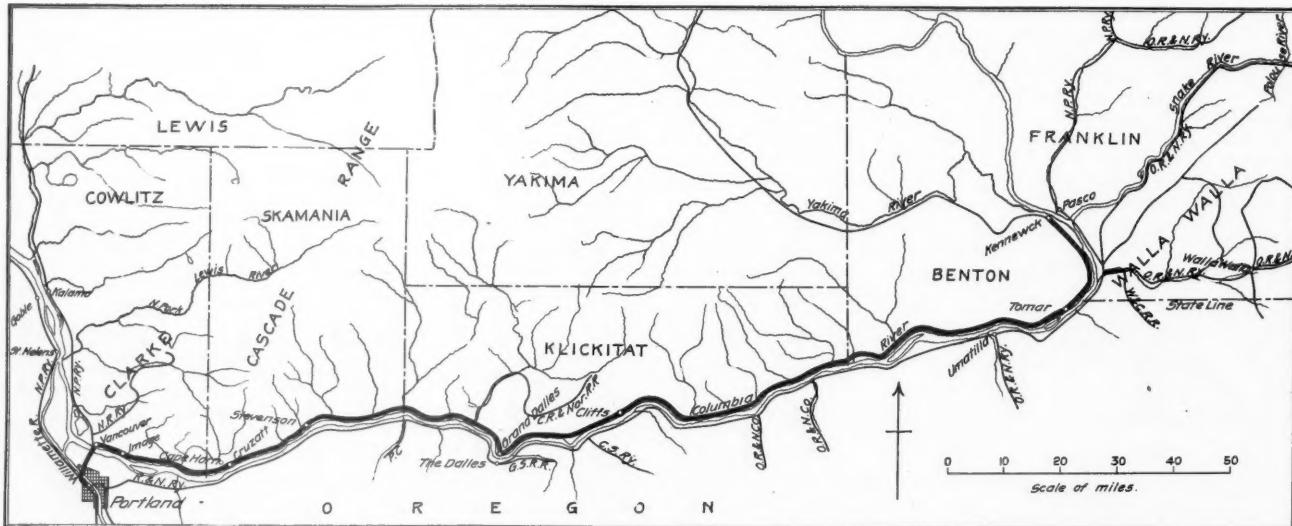
BY H. COLE ESTEP.

Probably the most spectacular piece of railroad construction in the United States to-day is the new line of the Portland & Seattle from Spokane, Wash., to Portland, Ore., by way of Pasco and the north bank of the Columbia river. The Portland & Seattle is, as is well known, a corporation owned jointly by the Northern Pacific and

tion was made during the summer and fall of that year. The locating engineers and their parties who actually did the work of laying out this line deserve the highest praise for the unflinching courage and silent heroism they manifested in the daily performance of their duties. The Portland & Seattle is built for miles and miles along cliffs on the north bank of the Columbia river, ranging from 100 to 700 ft. in height. Not only are there sheer cliffs, but the erosion has worn them into shapes of inconceivable ruggedness, the famous banks of the Rhine being tame in comparison. Pillars, pinnacles, sharp rocks and deep, narrow, perpendicular walled gorges abound. Only those who have had the experience and know what such work is can appreciate the difficulties encountered in locating a line through such a district. Passengers will ride over the finished track and admire the precipitous scenery, but as the writer stood on the nearly finished grade, which had been literally torn from the cliff by tons of blasting powder, and beheld the ragged face of the mountain, he could not help but think of and admire the splendid courage of the men who, suspended day after day on slender ropes, the sky above, the vicious, swirling river below, had slowly and painfully created a line of railroad over these places. The thought came that it was not dollars, after all, that produced the Portland & Seattle, but engineering skill and courage.

The ultimate purpose is to build a line from Spokane to Portland, a distance of 375 miles, with a branch 75 miles long to Lewiston, Idaho. The work now practically complete is that portion of the main line from Portland to Pasco, 230 miles, and the branch to Lewiston. The Spokane end is not so far advanced. Track laying is in progress between Portland and Pasco at this writing, and all the difficult, subaqueous work on the big bridges near Vancouver has been completed. Fifty miles between Portland and Pasco is being double tracked.

The road from east to west is level or down hill all the way. The maximum grade is 0.2 per cent. compensated for curvature; the maximum curves are 3 deg., spiraled according to the best modern practice. When these facts are considered, some of the difficulties encountered in locating along the tortuous bluffs of the Columbia can be appreciated. From Spokane to Cow creek, in Adams county, Washington, on the main line, and from Lewiston to Washtucna on the Lewiston line, there are no special features.



Map of the Portland & Seattle from Portland, Ore., to Pasco, Wash.

Great Northern railroads. Its name is scarcely accurate, however, as the line does not go within 180 miles of Seattle.

The road is being built ostensibly to get a direct low-grade freight route between eastern Washington and the coast and thus avoid the haul over the Cascade mountains. At present, on the western side, trains must be lifted from sea level to an elevation of 2,800 ft. in a distance of 75 miles. As a matter of fact, however, the Portland & Seattle would not have been built for years had it not been for the invasion of the state of Washington by the Chicago, Milwaukee & St. Paul and the Union Pacific. As soon as it was certain that these lines were building to Puget Sound, the Hill lines set to work on the Portland & Seattle in order to retain for themselves the only remaining water grade from the "Inland Empire" to tidewater. Construction work on the "North Bank" line, as the portion from Pasco to Portland is called, was actually begun simply in order to keep the other roads out; thus a project which, like all other Washington railroad schemes dates back about twenty years, became a reality.

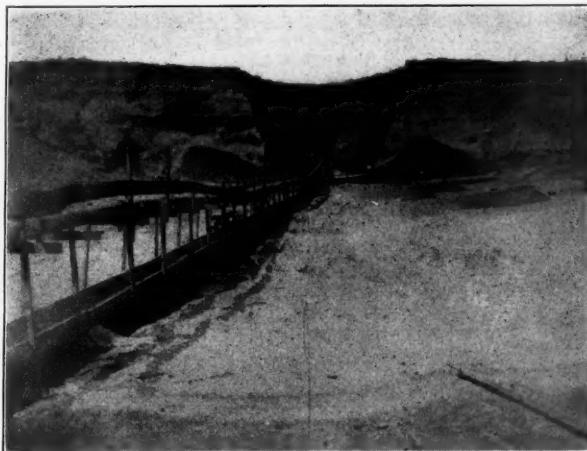
Preliminary surveys were commenced early in 1905. The loca-

The road through these sections is simply an ordinary first-class line through a broken country. There are six points of special interest on the work, located as follows: Near Cow creek and Washtucna, in Adams and Franklin counties; Pasco and Kennewick; Cliffs and Grand Dalles, in Klickitat county; Cape Horn in Skamania county, and the line from Image, in Clark county, Washington, to Portland. These will be taken up in the order named.

At the junction of Cow creek and the Palouse river, in Adams county, the Portland & Seattle encounters the most expensive stretch of railroad construction, except that in Devil's canyon, ever known in Washington. The valley is crooked and entered frequently by steep, narrow gulches; the road is built across a succession of "hog backs" and gulches. Eighty-foot cuts are followed by 90-ft. fills in alternation; short tunnels are frequent; high steel trestles are necessary in many places. At one point, near the ranch of James Kennedy, one of the largest of the "hog backs" was pierced by several long, narrow tunnels, which were loaded with many hundred pounds of powder, and then the whole hill was

blown off at one shot. The blast was a decided success and vividly demonstrated the economy of removing large masses of rock by this method.

Approaching Washtucna the line crosses a flat part of the coulee (many peculiar valleys in the region having no direct outlet are called coulees) on a fill approximately 6,000 ft. long and averaging 50 to 60 ft. in height. Here the line crosses the Palouse branch of the Oregon Railroad & Navigation. A concrete arch has been built to permit the latter to pass under the fill. The line



Hydraulic Excavation of a Deep Cut near St. John's.

passes the town of Washtucna on the side of Quality hill, several hundred feet above the village, and proceeding southwestward down the coulee, practically parallels the O. R. & N., the grade being in general about 8 ft. above the older line. Passing Kahlotus, in Franklin county, the line cuts off one corner of Lake Kahlotus on a huge fill, and proceeds, with easier construction, down to Pasco. It was first proposed to cross the lake on a trestle, but the more permanent and satisfactory rock fill was finally adopted.

At Pasco occurs the first crossing of the Columbia river. The Northern Pacific has recently rebuilt its bridge at this point, and the new structure will be used jointly by the two roads. From Kennewick, on the west side of the river, the North Bank line



Erecting First Span of Columbia River Bridge.

proper commences. The construction is fairly easy along the upper Columbia. Fences similar to the snow fences on eastern lines have been erected at dangerous points to keep off drifts of the fine sand abounding in the vicinity. For 20 miles west of Pasco, to Tomar, the line is double tracked. It is single track the rest of the way to Cape Horn, because a double track along the cliffs of the north bank would entail an expense at present altogether out of proportion to its usefulness.

Cliffs, half way down the river, will be a division point and

will have a roundhouse, coaling station, switch yard and other usual facilities. About 23 miles below Cliffs is Grand Dalles, opposite Dalles, Ore. The elevation of Dalles is 103, of Pasco, 389, and the distance between them is 130 miles, the average grade being 2.2 ft. per mile.

Below Grand Dalles the difficult solid rock construction commences. Nearly all the grade from this point to within 30 miles of Vancouver had to be blasted out of solid rock cliffs varying in height from 100 to 700 ft. There are 17 tunnels on the line from Pasco to Vancouver. The most notable of these is the Cape Horn tunnel, 24 miles east of Vancouver. It is half a mile long, single track, and bored through solid rock. From Cape Horn (Cruzatt station on the P. & S.) to Vancouver the construction is somewhat easier and this portion is double tracked.

Approaching Vancouver the line leaves the bluffs and curves down across the flats, crossing the east portion of the military reservation on a double-track fill averaging 16 ft. in height. The west end of the reservation, as well as the business portion of the town of Vancouver, is traversed by a double-track pile trestle. The fact that heavy concrete abutment walls are built at all road and street crossings under this trestle indicates that it is the intention to fill it as soon as the work can be conveniently done. At Vancouver there is to be a switch yard and junction with the Van-



Cape Horn on the Columbia River Before Work on the Portland & Seattle Was Begun.

couver branch of the Northern Pacific. This branch, 30 miles long, extending from Kalama, on the main line, to Vancouver, will become a part of the main line of the Northern Pacific as soon as the big bridges and heavy work on the Portland & Seattle between Vancouver and Portland are completed. Northern Pacific trains will be run to Vancouver and thence to Portland on the P. & S., using the magnificent new bridge over the Columbia. The historic old car ferry between Kalama and Goble will be abandoned and the line between Goble and Portland will be used almost exclusively by the Astoria & Columbia River Railroad. The Northern Pacific is now engaged in revising and straightening the Vancouver branch. When this relocation is finished the line will be first-class in every respect, this work being virtually a part of the construction of the Portland & Seattle.

Probably the most interesting section of the Portland & Seattle from an engineering standpoint is the eight miles between Vancouver and Portland. This short stretch includes three large steel bridges, three double-track draw spans, a steel trestle 1,968 ft. long, and one of the largest earth cuts on the road. The road is double-tracked from Vancouver to Portland.

The difficult work on the great Columbia river bridge is completed at this writing. The piers are practically finished. The

bridge, omitting inches, is 2,806 ft. long, divided into ten spans as follows from east to west (i. e., from Vancouver toward Portland): First span, 189 ft.; draw span, 467 ft.; third span, 375 ft.; fourth span, 269½ ft.; fifth, sixth, seventh and eighth spans, each 269 ft.; ninth span, 268 ft.; tenth span, 162 ft. The bridge is double track, its inside dimensions being: width, 27 ft. 6 in.; height, 22 ft. 6 in. A swinging draw is used, which when open, leaves two channels each 200 ft. wide. The piers are set on pile foundations. Those near the center of the stream are 115 ft. high, and at this writing project about 20 ft. above water. The piers are built with concrete cores and granite facings. The steel work is being furnished by the American Bridge Company. The bridge will be the largest and finest in this section of the country.

Following the Columbia river bridge is a steel trestle consisting of 24 82-ft. spans, 1,968 ft. in all, over the swampy end of the island opposite Vancouver. The trestle is followed by another steel truss bridge 1,465 ft. long over Oregon slough, divided into eight spans as follows from east to west (omitting inches): First span, 161 ft.; second, third, fourth, fifth, sixth and seventh spans, each 162 ft., and draw span, 332 ft. A swinging draw is used here also, leaving two 150-ft. clear channels when open.

The line enters northeast Portland, crosses some of the low land on a high fill, and traverses the suburb of St. Johns through a cut approximately 1½ miles long and 90 ft. deep at the west end. The cut is in earth, sand and loose gravel, and will require the excavation of 1,000,000 cu. yds. to complete it. It is being worked from both ends; from the east end by steam shovel in standard American fashion, while the west end is being sluiced down into the river by hydraulic methods. The water is pumped to the head works through a 10-in. riveted sheet-iron pipe, the stream is played on the earth and the mixture of water and earth is carried back to the river in a sheet-iron lined flume. It is said that 1,600 cu. yds. per day is excavated in this way.

The slopes of the cut are being trimmed by a donkey engine and scraper. The engine is placed on one side of the cut with a cable leading across to the other, to the end of which an ordinary drag scraper is attached. The scraper is started properly and is then dragged down the slope by the engine. It is hauled back by a

team, which at the same time drags another scraper down the opposite slope.

The Willamette river is spanned by a 1,700 ft. truss bridge with swinging draw span similar in general to the Columbia river bridge. After crossing the river the line ends at what is called the Portland outside yard, a switch yard built on a plot of ground 150 acres in extent.

The whole road is a splendid monument to American engineer-

Railroad Museum of the German Government.

The German Government has recently established a railroad museum in Berlin of which Germany may justly be proud. It was formally opened by the Emperor some months ago, but only one section was ready that time. All sections of the building are now open to the public. It is housed in the abandoned terminal of the Berlin-Hamburg line, which is situated in the northwestern section of Berlin. The exterior of the building has been left unchanged,



Government Railroad Museum in Berlin.

but inside many changes were made, chiefly in the cellar, where a large power plant was installed to generate steam for heating, electricity for lighting and operating motors, and compressed air to work several models for demonstrating purposes. The exhibition space covers 52,000 sq. ft. and comprises a long main hall with arched glass roof, and a number of smaller rooms in both wings.

A few exhibits were so large, however, that they had to be placed outside in the adjoining courtyard.

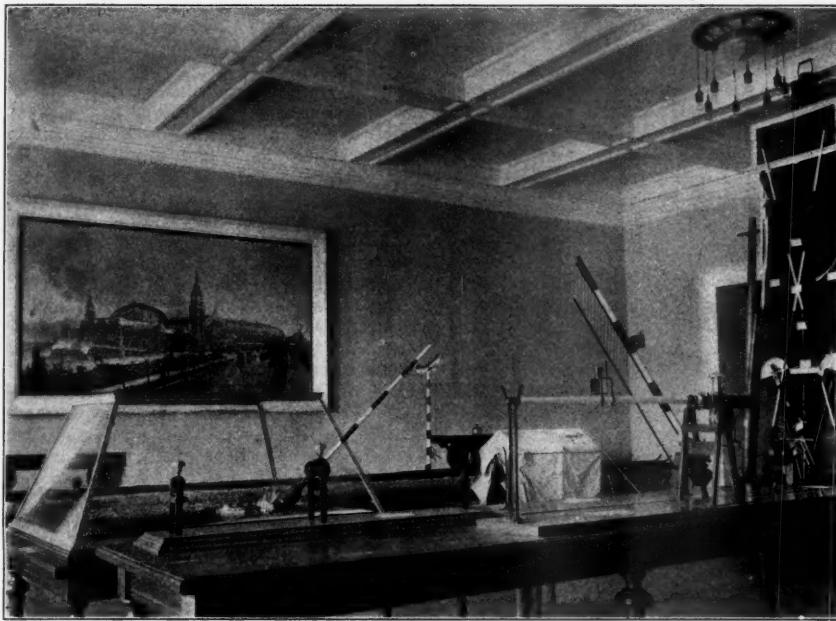
The museum comprises three large sections: A, railroads; B, marine engineering; C, architectural and construction work. By far the largest space is occupied by the railroad department, which is divided into eight groups. The exhibits represent chiefly modern apparatus, the historical part being limited. Explanatory notes are often given, supplemented by many photographs, drawings and other literature. Many of the models of apparatus can be operated to illustrate their working.

In the first group are rails of all kinds, switches, crossings, sleepers, both old and new. Samples of ballast and material for the maintenance of a road, also the tools used are shown. Of particular interest are sections of wornout rails and sleepers which show the tremendous stresses to which they are subjected on busy lines. The influence of shocks exerted by the rolling stock on the roadbed, etc., is illustrated by samples prepared in a special testing plant. A diagram of the sizes of rails used since 1842 shows clearly the considerable increase in height, length and weight. A complete exhibit of crossing gates used on country roads with the necessary bells, lamps and gate-keeper's houses is also included.

In the next group are models of structures designed for various railroad purposes, such as stations, carsheds, water towers, coaling plants, bridges, tunnels, turntables and the like. The chief exhibit is a fine relief model of the Altona depot which is a good example of a modern German terminal. The first large iron bridge is represented by a model of the Vistula bridge near Dirschau, completed in 1857. Drawings and photographs of old and modern bridges and tunnels give a good idea of this branch of engineering. A model of the ventilating plant of the Kaiser Wilhelm tunnel included in this section can be operated by a small fan.



Interior of Main Hall; German Railroad Museum.



Models of Crossing Gates and Exhibit of Track Tools.

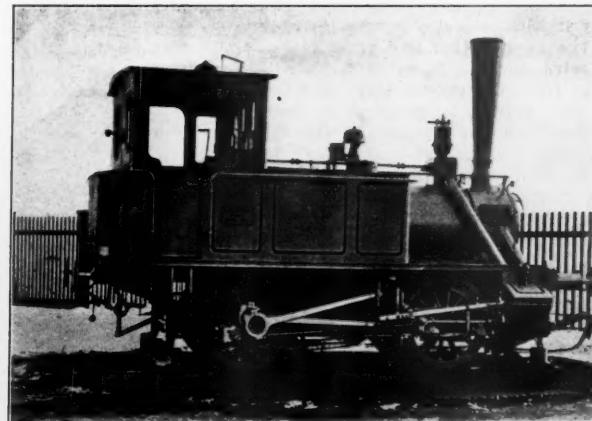
The next section is devoted to signaling and safety devices. No less than 500 devices designed to insure the safety of the traveling public are exhibited. An electrically operated interlocking plant and two mechanical plants are erected and can be operated in connection with a complete track layout, switches and signals outside the building. This is similar to the railroad exhibit of the German Government at the St. Louis exposition in 1904. In addition an electro-pneumatic interlocking plant and a number of block system installations, in full size as well as in miniature, are to be seen inside. Many of them can be operated. They are equipped with telegraphic and telephonic apparatus connected with other parts of the system in order to show the mutual relation of each to the whole. Electric alarms, all apparatus used by the station master,

brake testing racks, each consisting of 20 brakes of the Carpenter and Westinghouse types, respectively, are connected with the compressed air plant and can be used to demonstrate the action of brakes on a 20-car train. Numerous accessories supplement the locomotive section.

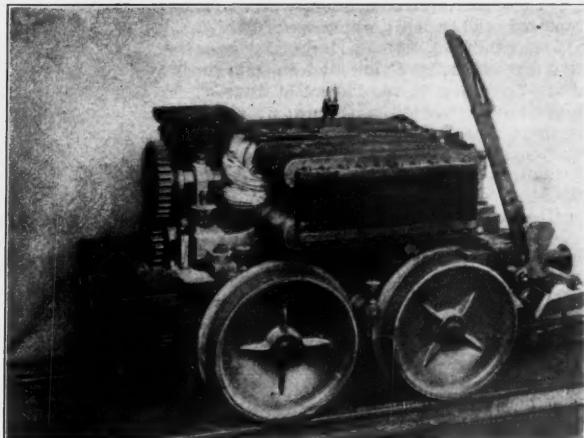
A large variety of cars are shown, comprising first, second, third and fourth class passenger vehicles, also workmen's, baggage, mail, funeral, hospital, dining and sleeping cars. The models are mostly one-fifth size and are made with a removable cover to allow in-



Exhibit of Signaling Devices.



A German Tank Locomotive of 1881.



First Electric Truck Built in Germany.

and block signals for single and double tracks are placed ready for operation. Old and new types show the considerable development of these devices.

The fourth department is the largest and to the general public the most interesting. It contains locomotives and cars. By far the greatest number of exhibits are models, the rest being photographs and drawings. The models are mostly one-fifth or one-tenth size, a few of the exhibits, however, being originals. These include the engine "Adler," of the first German railroad—Nürnberg-Fürth—of 1835, and the "Borussia," of the Cologne-Minden line of 1858. Modern locomotives for goods and passenger service, mountain lines, industrial purposes, etc., are shown by models. Most of these fine models were made by apprentices of the Prussian State Railway shops, while others are presents from manufacturing firms. A full size exhibit represents the cab of a modern express engine and steps have been provided to allow visitors to climb up on the platform. Another full size exhibit is the smokebox of a freight locomotive fitted with a Schmidt superheater which is so extensively employed in Germany, and a third is an old boiler of a locomotive built in 1887 which is cut open longitudinally and illustrates not only the location of the various pipes, valves, grate, etc., but also shows the effect of fire and water on the sheets. Two

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spection of the interior. The most curious object is an open third class carriage of the old Breslau-Freiburg line built in 1843. It contains wooden benches, but has no windows or roof. Full size sleeping compartments of old and new cars are shown. The freight cars supplementing this group are chiefly composed of cars for special purposes, for carrying long iron plates and bars, guns, long trees, glass, liquids, chemicals, cement, cattle, living fish, and the

trains are therefore pulled up by a steel cable running over a pulley and attached to a train on the adjoining track going down.

The next department gives a chance to study railroad management from a business point of view. It contains sample printed matter such as rules for stationmasters, engineers, gatekeepers, switchmen, etc., exhibits of devices used in making up trains, communications, tools and uniforms of officials. The method of weighing and checking baggage is illustrated by a full size elevator and scale. There is also a fully equipped ticket office with printing and stamping machine. A collection of railroad tickets from the earliest times is mounted in albums which are locked and carefully guarded. Samples of goods chiefly carried on the freight trains are exhibited in a glass case.

The last group is devoted to the finance and welfare work. Diagrams and literature illustrate the income and expenses of German railroads during the past 50 years and the enormous development of recent times. What Germany does for its railroad employees would be an object lesson to Americans. On German roads when an employee enters the service he is insured for his whole life against sickness and injury. In the museum is a large gilded obelisk which consists of three blocks representing in volume of gold the respective amounts of money spent for the relief of the sick, the injured, and on pensioned employees during the years 1895 to 1904. The total sum amounts to 131,451,321 marks, or \$26,300,000. Relief models show exteriors of workmen's dwellings, officers' homes, hospitals and homes for aged employees. The interior equipment of these buildings is shown by pictures and exhibits of medical instruments, beds, disinfecting apparatus, coffee-boilers, clothing and the like.



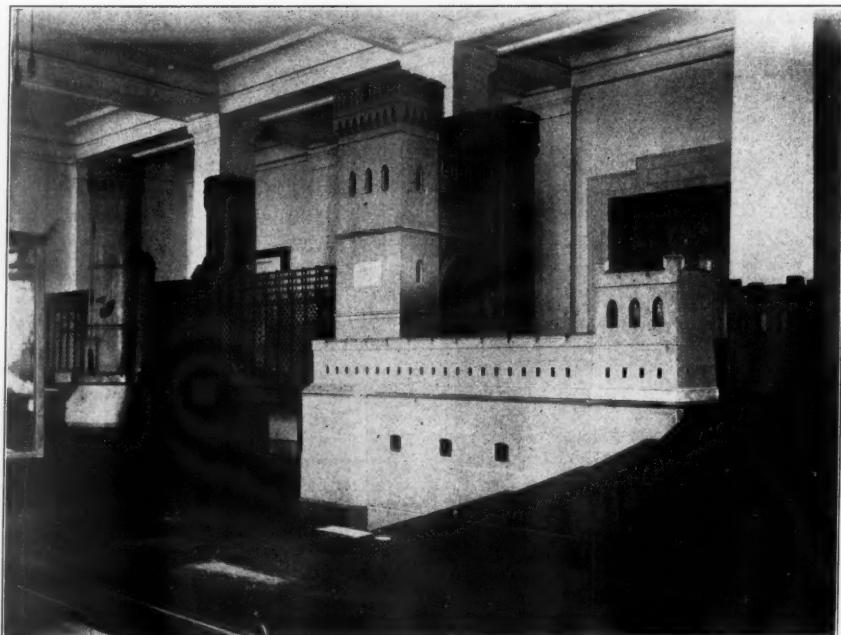
Model of Old Car Ferry Across the Rhine.

like. Over 400 exhibits show accessories, such as axles, couplers, doors, windows, heating, lighting and ventilating devices, dynamos, etc. A collection of broken axles, worn wheels, bent rods, brake-shoes, tubes and boiler plates is very instructive.

The next section is devoted to the application of electricity as a motive power. Many gifts have been received from the two leading electrical firms, and this section is complete in every way. It shows the development of electric apparatus from the earliest beginnings. Germany was the first country to use electricity for railroad purposes and a large picture on the wall shows the first electric train of 1876 run during the Berlin exposition. The exhibit includes full size controllers, rail-joints, overhead wires, insulators, track switches, underground conduits, motors, etc. The chief attraction is a model one-tenth size of the high-speed car which exceeded 200 kilometers per hour during the 1903 trials on the Berlin-Zossen road. Also the first practical single-phase motor ever built is shown.

The next department covers railroad shops and mechanical appliances. The Prussian Government does not build its own rolling stock, but owns several large shops where cars are repaired and rebuilt, samples of which work are exhibited. On a large table is mounted a relief model of the modern Opladen car shops belonging to the Elberfeld district, and a portion of the locomotive repair shops at the same place. The government devotes much attention to the care of apprentices in these shops, and many samples of their work are placed on exhibition, also models of typical institutes for training such apprentices. The equipment of the shops is represented by exhibits of machine tools, such as lathes for wheel-tires, steam hammers, hydraulic wheel press, jacks for lifting cars and engines, traveling cranes, a Dowson gas plant, an attachment for quickly exchanging wornout wheels, etc. In the main hall a large tilting coal wagon unloader is shown by model, a device for changing trucks from the standard to the wider Russian gage, and vice versa, etc. Models of old and new railroad ferries are shown, and also a model representing the only stretch of track in Germany which is too steep for ordinary adhesion trains. The

In the museum building the main hall and the west wing are given up to the railroad department, while in the east wing is an exhibit of marine engineering and civil engineering work. It is not so large but is nevertheless interesting and instructive. A large and modern library and reading room is attached to the museum



Model of First Large Iron Railroad Bridge in Germany Built in 1857 at Dirschau over the Weichsel River.

which in addition to the current journals and books chiefly concerning railroading contains many drawings and photographs and other valuable and rare documents. The museum is a worthy addition to Germany's educational institutions. The railroad man finds here many suggestions and ideas, while the public obtains an insight into many features of transportation about which there was always a mystery.

GENERAL NEWS SECTION

NOTES.

A court in Cass county, Missouri, has held that the law of that state, forbidding the employment of telegraph operators over eight hours a day, is unconstitutional.

Cornelius Burhans, a street car conductor of Brooklyn, N. Y., who has just been retired on a pension of \$30 a month, has been a conductor on street car lines in that city for 46 years. He is 72 years old.

The San Pedro, Los Angeles & Salt Lake has contracted for ten million barrels of crude fuel oil to be delivered within the next five years. The price increases from 30 cents a barrel in 1908 to 45 cents a barrel in 1911.

The United States Circuit Court of Appeals of the Eighth Circuit has affirmed the judgment of the District Court, given at Minneapolis last May, fining the Great Northern Railroad \$15,000 for granting illegal rebates.

Judge VanDevanter, in the Federal Court, has restrained the state railroad commissioners of Arkansas from enforcing a reduced rate on cotton, which they had ordered to go into effect September 16. The case will be heard October 15.

The Texas Railroad Commission is going to order reciprocal demurrage. The legislature at its last regular session passed a law authorizing the commission to adopt rules and regulations to govern this matter and a public hearing will be given October 8.

Press despatches from Chicago last Monday say that the principal railroads doing business in Kansas have decided to comply with the order of the railroad commission of that state requiring the reduction of all passenger fares to 2 cents a mile on the 4th of October.

It is estimated that the number of colonists arriving in southern California this month will amount to a total of 10,000, about 5,000 having arrived in the first week of the month. It is believed that the number of new settlers in the state this year, up to the end of December, will amount to 30,000.

The State Railroad Commission of Texas has ordered that between competing points the passenger fare by all railroads must be as low as that by the shortest line. The commission has also ordered that the long-and-short-haul rule (as laid down in the Interstate Commerce law) shall be observed in all cases in Texas.

The Missouri, Kansas & Texas has a tie treating plant at Greenville, Tex., which for most of the time for a year or more has not been in operation because the machinery was being changed. Ties will now be treated by the Rueping or creosote process instead of the zinc chloride process, which was found unsatisfactory.

At a hearing before the New York State Public Service Commission at Buffalo last week, the Secretary of the Corn Exchange gave statistics showing that shippers last autumn had to wait from six to 66 days for freight cars. The longest delay was in the case of an order for 26 cars asked for from the New York Central to be delivered to the City Elevator.

A hundred or more companies and individuals owning refrigerator and tank cars are proposing to form an association. The owners of these classes of cars are not inclined to join the Individual Car Owners' Association which was recently started at Pittsburgh, believing that the Pittsburgh men, mostly coal car owners, will have to sell their cars to the railroads.

In Huron county, Ohio, the Baltimore & Ohio Railroad has been sued for \$100 damages for running a train last June from Chicago Junction to Cleveland, 110 miles, in which there was a coupler without an uncoupling chain, thus making it necessary for the brakeman to go between the cars. This suit is prosecuted at the instance of the Ohio State Railroad Commission.

It is announced in Philadelphia that the Pennsylvania and the Reading railroads will, on October 1, reduce to 2 cents a mile all passenger fares now higher than that figure. The expected decision from the higher court in the suit which was appealed by the Pennsylvania Railroad will not be issued before October. The Baltimore & Ohio will also adopt the 2-cent rate in Pennsylvania.

The state health commissioner of Pennsylvania has ordered that sheets in sleeping cars must be long enough to turn over at the upper end 24 in. As the only sleeping cars in Pennsylvania are

those run by the Pullman Company, in which the blankets are covered with sheets their whole length, this order would seem to be rather behind the times. The health commissioner also orders that in parlor cars the porters must not brush the clothing of passengers, except at the end of the car. Nothing is said about the application of a rule of this kind to sleeping cars. Probably the commissioner recognizes this as a problem too tough to be tackled offhand.

The Yale and Harvard, the new turbine steamers of the Metropolitan Steamship Company, running between New York and Boston, made their first regular trips on the night of September 18, one steamer leaving Boston and the other New York at 5 p.m., and each reaching their destination the next morning at about 7:30. The distance is 292 miles. The vessels were well loaded with passengers, one of them having 400.

The Superintendent of Motive Power of the Long Island Railroad has been arrested for misdemeanor in allowing a locomotive to be run in the Long Island City yard by an Italian laborer, the engine having run over and killed an engine-inspector while it was in charge of the Italian. Under the Penal Code of New York it is a misdemeanor to allow an engine to be run by a person who cannot read and write the English language.

A statement is going the rounds of the newspapers that in a single year the railroads of the country have been fined over \$800,000 for unsatisfactory handling of the mails; and the New York Central is said to have had nearly \$37,000 deducted from its compensation in the three months ending March 31 last. Not all of the fines are for slow movement of trains; a considerable portion is for carelessness or neglect in the handling or delivery of bags.

A press despatch from Omaha, September 24, says that the four principal railroads of Nebraska have succeeded in keeping their suits against the state in the Federal Court. They brought injunction suits against the enforcement of a 15 per cent. reduction in certain freight rates which was ordered by the legislature, and the Attorney-General of the state sought to have the questions adjudicated in the Supreme Court of the state. In this he has been defeated.

A reporter at Bloomington, Ill., is the latest expounder of the conservative sensation. He has issued the story about a freight car being lost "unbeknownst." This time it occurred on the Chicago & Eastern Illinois. Conductor Boughter started to set out four cars at Woodland Junction one night recently and found that only three of them were in the train. The train had broken in two some distance back and one car was found off the track; but it was put on again and the train was coupled up and moved on without any serious damage being observed. A following train, however, found the missing car standing nearly upright just clear of the track.

It is reported from the City of Mexico that the judges of the district courts in Mexico have been officially advised to cease their unjust practice of detaining and imprisoning railroad employees on charges of manslaughter when men are killed by trains. There have been many cases where, in consequence of the unavoidable death of a tramp walking on the track, the engineer and perhaps other men on the train have been arrested and imprisoned for months awaiting trial on a serious charge, the officers of the law evidently assuming that someone on the train was necessarily blameworthy. It appears that President Diaz has ordered this practice stopped and that the present notice has been made necessary because the President's order has not been uniformly obeyed. It is gratifying to see that Mexican practice in this respect is in the way of improvement. Before long Mexico will be more civilized than New York city in this respect.

A Tip for the New Haven Road.

According to a story going the rounds of the press, experiments have been conducted by the head of the government college at Caracas, Venezuela, to determine how much electric force electric eels are capable of yielding. Copper wire collars were put around the necks of 100 of these creatures and connections were made between all the collars and a motor, the eels being in a zinc bath. Twenty horse-power current was generated, and with this the scientist ran a mill and lighted up his house and grounds. The power from one eel sufficed to produce a 45-candle incandescent light. It was found that a motor car can be run for 24 hours with 100 eels in a tank 3 ft. long and 1½ ft. square, and weighing complete less than

200 lbs. On this basis it is estimated that the largest ocean steamers afloat can be run with 200,000 eels, producing 40,000 h.p., and contained in a tank not larger than 10 by 10 by 15. This plant, of course, will have to be duplicated so that when the energy in one is exhausted it can be hoisted from the hold to the deck so that the sunlight may infuse new energy into it while the power is furnished by the relay plant.

It is plain that this story did not originate in New York, or at any rate not in Wall street. To be complete it should include a plan for a corporation, with suitable blocks of preferred and common stock, with a prospectus setting forth the number of hatcheries, receiving stations, barrels, trainers, electricians, switch boards, accumulators, etc., that would be required by a concern established to supply eels to all the transatlantic and coastwise steamships. On the New Haven road one night recently a thousand suburban passengers were detained from their dinner tables for an hour or two by the 11,000-volt current going astray and leaving trains standing dead. We are quite sure that no eel, properly trained, would ever be guilty of such dereliction.

Belmont Tunnel Test Trip.

The formal "first trip" through the north tube of the Belmont tunnels under the East river, New York, was made on September 24. The guests included, among others, members of the Public Service Commission of the First district, some of the higher city officials, and officers of the companies operating the subway, elevated and surface lines. The car made the round trip between Third avenue and Forty-second street, Manhattan, and Van Alst avenue and Fourth street, Long Island City. At the luncheon afterward, August Belmont, Chairman of the Board of the Interborough Rapid Transit, said, in part:

"We acquired this franchise in February, 1902, under advice of Strong & Cadwalader that the franchise was perfectly valid, but, notwithstanding, there were certain technicalities to be reviewed. Up to this time the history of corporations in this state was that any company that had undertaken seriously to perfect its franchises and construct the road before the expiration of the franchises was entitled to an extension of the time. We had 18 months to do this work, but we believed that if we went forward earnestly and sincerely we would have no difficulty in obtaining an extension.

"You know the reason why we did not get it. Public clamor against extension in franchises in perpetuity had arisen in the meantime. This was a great injustice to the company, as we were the only one that had actual work under way, and we were trying sincerely to get the work done by the first of January, 1907, and had no obstacles been thrown in the way the work would have been completed during the term of the franchise. I have not a word of regret nor have any of my associates.

"As to the legality of the franchises, the courts have not yet condemned them. As for us, we have still to learn that we have done anything illegal. The city has nothing to say concerning the franchises only as to that part in Manhattan and a small part in Long Island City. The portion under the East river is in control of the state of New York, from which we obtained legal permits. From the bulkhead line in Long Island City to Fourth street we have obtained a grant in perpetuity from the Pennsylvania Railroad Company.

"The company is prepared to operate whenever it can be done under any reasonable and fair arrangements. It is impossible for anybody to make that tunnel pay for three or four years. The business is not there to pay interest on the cost of the tunnel and the equipments. It is not as valuable to us as it is to the city of New York.

"The Interborough company is the only company, in my experience, that can claim the distinction of doing any serious service for the improvement of traffic conditions in Greater New York, in spite of the abuse it has received. I say that the treatment of this company has not been such as to inspire further effort on the part of private enterprise, and until private enterprise is encouraged and confidence restored we won't have any improvement."

Steel Ties on the Bessemer & Lake Erie.

The Bessemer & Lake Erie has completed plans for using steel ties on its lines next year. More than 70,000 will be used for renewals and repairs, where wooden ties are now in use. By the end of next year more than 90 miles of track will be laid with steel ties. Railroads controlled by the United States Steel Corporation are now using over \$500,000 worth of steel ties, or enough to lay 160 miles of track. Roads not identified with the corporation are using about 120,000 steel ties on 40 miles of track. During the present year the company has sold about 3,000 tons of ties. A plan has been completed whereby the ties can be insulated, making them available for electric roads.

President Finley on Postponement of Improvements.

The following is from a statement by President Finley, of the Southern Railway: "It has been represented that work has been stopped and forces reduced as a measure of retaliation against adverse state legislation. In no case has this been true. Current railroad income is insufficient to provide funds necessary for extensive improvements and betterments. These can only be provided for, now as in the past, by obtaining new capital. Present financial conditions and the present attitude of investors toward railroad securities are such that it is impossible, for the moment, to sell securities on a basis that any business concern, managed in accordance with sound business principles, would be justified in accepting. It has, therefore, been necessary to postpone many important projects for improvements. Only those will be pushed to completion at this time on which work has progressed so far that the public and the railroad can receive the benefit of their completion at an early date. Other projects have not been abandoned, but will be carried out just as soon as conditions are such that the necessary capital can be secured. Forces have been reduced and expenses curtailed, in the same ratio, in those states in which there has been no adverse legislative action as in others."

Judge Shull on the Two-Cent Law.

In the case of the Susquehanna River & Western Railroad, 13 miles long, Judge Shull, of the Perry County Court, Pennsylvania, has declared the two-cent fare law of that state in derogation of both the United States and the Pennsylvania constitutions. He quotes figures of the company's earnings to show that the enforcement of the rate would be confiscatory. He says that the act is a "caprice of a Legislature many of whose members, without rhyme or reason, facts or figures, information or reputation, were pledged to perform the act in the name of 'reform.' We might say of reform as was said by Madame Roland of liberty in the days of the French Revolution: 'Oh, Liberty, Liberty! How many crimes are committed in thy name!'" To compel this company to comply with the law would rob the bondholders of their securities, deprive the community of the facilities for transportation of freight and confiscate the property and franchises of the stockholders.

Forty Passengers Killed in Mexico.

In a collision between a passenger train and a freight on the Mexican Central, near Aguascalientes, on September 19, 40 or more passengers were killed and 34 injured.

In the South.

A southern railroad had stationed, at a highway crossing, an old negro watchman, whose duties consisted in warning travelers when a train approached. One night a wagon belonging to a farmer was struck, resulting in a bad accident. The company was, of course, sued for damages, and at the trial the old darky replied to the questions put to him in a clear, direct fashion. Among these questions was one as to whether he was sure that he had swung his lantern across the road when he perceived the train approach. The negro replied:

"I shorely did, sah!"

The trial resulted in a verdict for the company and the counsel took early occasion to compliment the aged negro on his excellent testimony. To which the latter replied:

"Thankee, Marse John, but I was shorely skeered when dat lawyer man begin to ask me about de lantern. I was afearred for a minute dat he was goin' to ask me if it was lit or not. De oll done give out some time befo' de accident!"—Exchange.

President Diaz's Review of Mexican Railroads.

In his recent message to the National Congress of Mexico, President Diaz gave a review of the progress of railroad construction in that country as follows:

"The unpropitious condition of the foreign markets is the reason that arrangements for the merger of the National Railroad of Mexico and the Mexican Central Railway have not been consummated. A decree was issued on July 6, last, laying down the lines along which the Mexican company that will take over the two properties in question is to be incorporated; but in view of the circumstances it does not seem wise to go on as yet with the incorporation or with the financial operations to which it must give rise.

"Last January the formal inauguration of freight traffic over

the Tehuantepec National across the Isthmus of Tehuantepec took place. During the first five months of operation 123,000 tons of goods were transported across the isthmus, giving a monthly average of 24,600 tons. The company has received 300 new freight cars, which, with those built and repaired at its shops, give an equipment of 1,062 freight cars. The earnings of this railroad have increased by reason of the new freight traffic, the proportion of increase in earnings in the last half year from January to June last, as compared with the same period of the previous year, being 265 per cent.

"The new railroads built in Mexico during the last six months aggregated 171 miles, the largest contributions of new track being those of the lines between Jarita and Columbia, on a branch of the National; the extension of the Pan-American; the line between Ocotlan and Ototonilco, which is a branch of the Mexican Central; the Cananea, Yaqui River & Pacific; and the line from Navajoa to Guadalajara. In addition to the new track, subject to federal jurisdiction, there were new lines subject to state jurisdiction constructed, aggregating 128 miles, making a total of 299 miles of new track constructed during this period. The total length of the railroads of Mexico is 13,882 miles."

Rail Conference.

The following announcement was made last Tuesday: "About 30 representatives of the leading railroads and steel manufacturing companies are in attendance at the conferences. The steel rail question is being thoroughly discussed, and various types of rails which may help to solve the problem are being examined and considered. There is every indication that new types of rails will be agreed upon which will be satisfactory to railroads and manufacturers alike."

University Appointments.

Howard C. Ford, C.E., has been appointed Assistant Professor of Irrigation Engineering and Surveying at the Iowa State College, Ames, Iowa. Mr. Ford is a graduate of the University of Colorado and has been Instructor in Civil Engineering there for three years. Harry J. Kesner, a graduate of the Civil Engineering department of the University of Colorado, has been appointed Instructor in Bridge Engineering in the University of Minnesota. Clement C. Williams and Arthur P. Poorman have been appointed Instructors in Civil Engineering in the University of Colorado. Mr. Williams is a graduate of the University of Illinois and has been for nearly two years on the Delaware, Lackawanna & Western. Mr. Poorman is a recent graduate of the University of Illinois, and has since been in the Weber Concrete Construction Co.

TRADE CATALOGUES.

Ideal Power.—The leading article of the Chicago Pneumatic Tool Co.'s monthly for September is, "The Little Giant Drill Compared with a Stationary Engine and a Locomotive." Asserting that the demand for high-speed portable pneumatic tools is temporary and that good practice will again come back to tools with maximum speed equal to the maximum cutting power of twist drills, comparison of the work done by different classes of such drills is made with a stationary engine and with a locomotive, and a good case made out for the drills. Other articles are, "Sun's Rays Converted Into Power"; "Packing Foreign Shipments"; "Compressed Air in Railway Shops," being extracts from the discussion of a paper before the Central Railway Club; "Pneumatic Tools on Egyptian State Railways," and the program of the nineteenth annual convention of the American Boiler Manufacturers' Association to be held in Atlanta, Ga., Oct. 8, 9 and 10.

Drills.—The Cleveland Twist Drill Co., Cleveland, Ohio, sends a celluloid disc which shows, on one side, the feed per revolution per minute with high speed and the carbon drills for wrought iron, machinery steel, and soft tool steel; and, on the other side, the decimal equivalents of fractions. The disc is indestructible, it can be carried in the vest pocket and is a very convenient thing to have.

MANUFACTURING AND BUSINESS.

Edward Laterman has been appointed representative in New York city of the O. M. Edwards Co., Syracuse, N. Y.

F. P. Huntley, for some years Secretary of the Gould Coupler Company, New York, has been elected Vice-President and General Manager. He has been succeeded as Secretary by George G. Milne.

The American Bridge Company, Pittsburgh, Pa., turned out 59,000 tons of fabricated steel during August, which is said to be 1,500 tons more than any structural steel plant has ever finished in one month.

The Union Switch & Signal Co., Swissvale, Pa., has opened the office of its Canadian branch in the Sovereign Bank building, Montreal. V. K. Spicer, Western Manager, will remain in Canada for a few months to get this branch started.

The Pittsburgh Steel Co., Pittsburgh, Pa., has let contracts to the Ritter-Conley Company and the McClinic-Marshall Construction Company, Pittsburgh, for buildings at its open hearth steel plant at Monessen, Pa. The work will require 3,500 tons of structural shapes.

According to a Chicago despatch, the Pullman Company is now employing 8,000 men. Early this year its working force was 10,500 men, but the company has caught up with its orders enough to allow of this reduction in employees. No further reduction, however, is contemplated.

The Cuba Railroad recently bought a No. 4 "K" Gates crushing plant built by the Allis-Chalmers Company, Milwaukee, Wis., for use at Camaguey, Cuba. This machine will be mounted on masonry foundation and fitted with smooth head and concaves; it is to be used to crush limestone to $\frac{1}{2}$ in. size.

The Scullin-Gallagher Iron & Steel Co., St. Louis, Mo., has moved its St. Louis sales department from 412 Lincoln Trust building to 1401 Syndicate Trust building, and its New York sales office from the Trinity building to 1 Wall street. A Denver, Colo., sales office has been opened in the Majestic building.

The Pennsylvania recently equipped a large number of 100,000-lb. capacity cars with Schoen solid steel wheels, replacing cast-iron wheels. The marked capacity of these cars has been increased to 110,000 lbs., with an allowance of 15 per cent. overload because the car bodies and truck frames are amply strong to carry the increased load.

The Chicago & North-Western's plant for treating railroad ties at Escanaba, Mich., is to be enlarged at an expense of \$25,000. In addition to the Wellhouse process, now in use, the Rutger creosote process is to be employed hereafter. With the Wellhouse process (chloride of zinc) only soft timbers can be treated to advantage, but with the creosote process hard woods can be treated with profit.

The Chilean Government is asking bids on railroad construction on the state railroads; also for an electric light plant, etc. The estimate is about \$600,000. Address Minister of Industry, Communications and Public Works, Santiago, Chile. A concession has been granted Señor Pedro A. Rosseldt, of Santiago, for railroad construction estimated at about \$4,000,000. He may be addressed care of the Minister of Industry.

During the traveling engineers' convention in Chicago, special opportunity was given the members to examine in a body the new roundhouse and other up-to-date locomotive terminal facilities that have lately been finished by the Chicago & Western Indiana, one of the belt roads. The roundhouse is equipped with the Miller system for washing out and refilling boilers; it was installed by Julian L. Yale & Co., Chicago. A special train took the convention members to the terminal.

The Cleveland Twist Drill Co., Cleveland, Ohio, has bought the business and plant of the Three Rivers Tool Co., Three Rivers, Mich. The machinery will be immediately installed at the purchasing company's works at Cleveland. J. G. Matthews, former manager of the Three Rivers plant, will have charge of the making of the "Peerless" reamers. The blades of these tools are high-speed steel brazed into a body of low carbon steel. Both solid and expansion types will be made.

The new power stations of the North Shore Electric at Waukegan and Blue Island, near Chicago, are furnished with alternating current electric cranes made by the Northern Engineering Works, Detroit, Mich. These are 30-ton and 25-ton capacity cranes respectively, 58 ft. and 39 ft. span. The larger crane is equipped with an auxiliary high-speed alternating current hoist. The Black Hills Traction recently installed an eight-ton, 32-ft. span, Northern traveling crane at Spearfish, S. Dak.

The Isthmian Canal Commission will receive bids until October 14 for automatic fire-alarm telegraph systems, marine electric fixtures, fire hose, hose nozzles, fire harness and attachments, firemen's helmets, batteries, dynamite and blasting material, fusible plugs, wire, hoisting engines, shop machines, steel, iron, zinc, copper, brass, rivets, bolts, chain, wrought-iron pipe, cast washers, gaskets, packings, rubber and wire sleeves for dredges, canvas, cotton waste, kerosene, oils, wrenches, ratchet drills, anvils, swage blocks, blacksmith's

mandrel, tire-measuring wheels, crucibles, lamps, dump wagons, piles, bridge timber, etc.

The Isthmian Canal Commission has ordered three steel barges of 400 tons capacity each from the Maryland Steel Company at \$59,495, delivery to be made in 120 days. The bid of the United States Steel Corporation was for \$85,575, delivery to be made in 225 days. Other bids for the barges were: Newport News Shipbuilding & Drydock Company, \$69,000, and Lewis Nixon, \$76,950. The lowest bidder for six heavily constructed steel barges for rough work at Panama is the Maryland Steel Company at \$125,700, delivery in 200 days, while the steel corporation quoted \$135,300, delivery in 230 days. Bids for 12 more steel barges are to be called for soon.

Iron and Steel.

The Atchison, Topeka & Santa Fe has ordered 8,000 tons of bridge steel.

The New York Central & Hudson River has ordered 2,500 tons of bridge steel.

The Lehigh Valley has ordered 2,250 tons of Bessemer rails from the Pennsylvania Steel Co. at \$28 a ton.

The Chicago, Milwaukee & St. Paul will soon give an order for 2,500 tons of bridge steel for use on its Pacific extension.

The Carnegie Steel Company has ordered 1,000 tons of fabricated steel from the American Bridge Company for a new power house at its Youngstown plant.

OBITUARY NOTICES.

Samuel Sloan, Chairman of the Board of the Delaware, Lackawanna & Western, and formerly President of that company, died on September 22 at his home at Garrison-on-Hudson. Mr. Sloan was nearly 90 years old.

Henry Clarkson Wicker, formerly President of the Fort Worth & Rio Grande, died on September 20 at his home at Glen Cove, L. I. Mr. Wicker was born at North Ferrisburgh, Vt., in 1840. After graduating from Williston Academy, he began railroad work in 1861 as a clerk in the general freight office of the Chicago & Alton. He was for two years an agent of the Chicago & Milwaukee, now part of the Chicago & North-Western, and in 1866 was made General Freight Agent of the Chicago & Alton. Two years later he was appointed General Freight Agent of the North Missouri, now part of the Wabash, and in 1873 was made joint General Eastern Agent of the Chicago & North-Western, the Chicago, Rock Island & Pacific and the Chicago, Burlington & Quincy. In 1875 he was appointed General Freight Agent of the Chicago & North-Western, being later made Freight Traffic Manager and then Traffic Manager. After being out of railroad service for a year, he was, in 1900, elected President and General Superintendent of the Fort Worth & Rio Grande, from which position he resigned, in the summer of 1901, to become a member of the governing board of the Southwestern Rate Association.

MEETINGS AND ANNOUNCEMENTS.

(For dates of conventions and regular meetings of railroad conventions and engineering societies, etc., see advertising page 24.)

Association of Railway Financial Officers.

At a meeting held in Niagara Falls last week an association was organized, with this name, by the treasurers and financial officers of a number of prominent roads. The President is F. H. Hamilton, Secretary and Treasurer of the St. Louis & San Francisco, St. Louis.

Railway Signal Association.

The annual meeting of this association will be held at Milwaukee, October 8, 9 and 10. The first session will be called at 10 o'clock Tuesday, the 8th. The headquarters of the association will be at the Hotel Pfister.

At this meeting committee reports will be submitted as follows:

- Standard specifications for electric interlocking.
- Standard specifications for mechanical interlocking.
- Automatic block signal systems.
- Costs and estimates for installation.
- Committee on signaling:
- Standard specifications for automatic block signaling.
- Foreign current on automatic block signaling.
- Signal lamps.
- Maintenance of automatic block signals.
- Circuits for interlocked signals.
- Rubber covered wire.
- Maintenance manual controlled signals.
- Storage battery.
- Office records.
- Circuits for manual block signal systems.
- Signal definitions.

The Signal Appliance Association has arranged for a theatre party on the evening of the 8th and for carriage rides and other entertainments for the ladies on both Tuesday and Wednesday. On Wednesday evening there is to be a banquet at which the following gentlemen are expected to speak: G. R. Peck, General Counsel of the Chicago, Milwaukee & St. Paul; W. A. Gardner, Vice-President of the Chicago & North-Western; Azel Ames, Jr., Signal Engineer of the New York Central & Hudson River; John I. Beggs, General Manager of the Milwaukee Electric Railway & Light Company, and E. Morse, President of the Simplex Electric Company. The chairman of the exhibit committee is R. A. Patterson, 12 Dey street, New York, and of the local committee of arrangements, W. J. Gillingham, Jr., 1423 Monadnock Block, Chicago.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Alabama Railroad Commission.—The members of this commission are: Charles Henderson, President, Troy, Ala.; W. D. Nesbitt, Birmingham, Ala., and J. G. Harris, Montgomery, Ala. S. P. Kennedy, Anniston, Ala., is Secretary.

Cache Valley.—G. W. L. Brown has been appointed Assistant to the Vice-President and General Manager, with office at Sedgwick, Ark.

Chicago, Indianapolis & Louisville.—L. W. Parker, of Chicago, has been elected a Director, succeeding Gilbert B. Shaw, of Chicago.

Chicago, Milwaukee & St. Paul.—L. J. Pettit, President of the Wisconsin National Bank, Milwaukee, Wis., has been elected a Director, succeeding Joseph Milbank, resigned.

Denver & Rio Grande.—See Missouri Pacific.

International & Great Northern.—See Missouri Pacific.

Kansas Railroad Commission.—The members of this commission are as follows: G. W. Kanavel, Chairman; C. A. Ryker and Frank J. Ryan. E. C. Shiner is Secretary and Rate Clerk.

Louisville, Henderson & St. Louis.—Otto Marx and William Bullitt have been elected Directors, representing minority stockholders.

Missouri Pacific.—A. C. Bird, Vice-President in charge of traffic of this road and of the Denver & Rio Grande, the Rio Grande Western and the Texas & Pacific, has resigned, effective October 1. Mr. Bird has been on leave of absence because of continued ill health for the last two years. J. M. Johnson, Assistant to Mr. Bird, has been appointed Assistant to Vice-President C. S. Clarke of the Missouri Pacific, to Vice-President L. S. Thorne of the Texas & Pacific, to Vice-President C. H. Schlacks of the Denver & Rio Grande and the Rio Grande Western, and to Vice-President Leroy Trice of the International & Great Northern.

Nebraska Railroad Commission.—The members of this commission are: H. J. Winnett, Chairman, J. A. Williams and H. T. Clarke. Clark Perkins is Secretary.

Nevada Railroad Commission.—The members of this commission are: H. F. Bartine, Chairman, Henry Thurtell and J. F. Shaughnessy. E. H. Walker is Secretary.

Oregon Railroad Commission.—The members of this commission are: Thomas K. Campbell, Cottage Grove, Chairman; Oswald West, Astoria, and Clyde B. Aitchison, Portland. George O. Goodall is Secretary.

Rio Grande Western.—See Missouri Pacific.

Texas & Pacific.—See Missouri Pacific.

Operating Officers.

New York, New Haven & Hartford.—W. G. Bierd, who recently resigned as General Manager of the Panama Railroad, has been appointed General Superintendent of the New York, New Haven & Hartford, succeeding O. M. Shepard, assigned to other duties.

Toledo & Indiana.—H. C. Warren, General Superintendent of the Toledo, Port Clinton & Lakeside (electric), has been appointed General Manager of the Toledo & Indiana, succeeding E. Darrow, resigned to go into other business.

Traffic Officers.

Chicago, Indianapolis & Louisville.—The statement published in our issue of September 13 that B. E. Taylor, General Manager, had been appointed General Freight Agent succeeding O. C. Carter was a mistake. Mr. Carter remains General Freight Agent and all correspondence concerning the general freight department should be addressed to him, the office of Traffic Manager, held by the late Charles H. Rockwell, having been abolished.

Chicago, Milwaukee & St. Paul.—J. M. Davis, division freight agent at Milwaukee, Wis., has been appointed to the re-established

office of Assistant General Freight Agent at Milwaukee, effective October 1.

Pittsburgh & Lake Erie.—J. B. Nessle, General Agent at Pittsburgh, Pa., has been appointed Assistant General Freight Agent.

Southern.—C. D. Morris, chief clerk to the General Freight Agent of the St. Louis-Louisville lines, has been appointed to the new office of Assistant General Freight Agent of these lines, effective October 1.

Engineering and Rolling Stock Officers.

Illinois Central.—R. E. Fulmer, Master Mechanic at Paducah, Ky., has resigned to go to another road.

New Jersey Railroad Commission.—Alfred P. Boller has been appointed Civil Engineer, and Boller & Hodge, New York, Consulting Engineers to the commission.

LOCOMOTIVE BUILDING.

The Cincinnati, Hamilton & Dayton is said to be thinking of buying locomotives.

The New York Central Lines are figuring on their usual fall order for locomotives.

The Japanese Government has decided to buy 900 locomotives during the five years beginning with 1908.

The Chicago, Cincinnati & Louisville has ordered five consolidation locomotives from the Baldwin Locomotive Works.

The Austrian State Railroads are asking bids on 43 locomotives, to cost about \$800,000, for the Northern lines. Address, Nordbahndirection, Vienna.

The Trinity & Brazos Valley has ordered three simple consolidation locomotives from the Baldwin Locomotive Works.

General Dimensions.

Type of locomotive	Consolidation
Total weight	176,500 lbs.
Weight on drivers	157,000 "
Diameter of drivers	57 in.
Cylinders	20 in. x 28 in.
Boiler, type	Extended wagon top
Boiler, working steam pressure	200 lbs.
Tubes, number	265
" material	Shelby seamless steel
" diameter	2 in.
" length	14 ft. 2 "
Firebox, length	120½ "
" width	39½ "
" material	Otis steel
Grate area	32½ sq. ft.
Heating surface, total	2,169 "
Tank capacity	8,000 gallons
Coal capacity	10 tons

Special Equipment.

Brake-beams	National hollow
Brake-shoes	Diamond steel back
Couplers	Tower
Draft gear	Westinghouse friction
Headlights	Pyle National
Injector	Monitor
Journal bearings	Hewitt
Journal boxes	Franklin
Piston and valve rod packings	Jerome
Safety valve	Crosby
Sanding devices	Leach
Sight-feed lubricators	Nathan
Springs	Springer
Steam gages	Ashcroft
Tires, driving wheel	Standard Steel Works
Tires, truck wheel	Standard Steel Works
Tires, tender wheel	Standard Steel Works

CAR BUILDING.

The Canadian Pacific is figuring on building 2,000 box cars at its own shops.

The Chicago City Railway, it is said, has ordered 300 Montreal type street cars.

The United Zinc & Chemical Co., Kansas City, Mo., is in the market for 15 tank cars.

The Southern Indiana has ordered 500 gondola cars from the Haskell & Barker Car Co.

The Southern is said to have ordered 500 freight cars from the American Car & Foundry Co.

The New York Central Lines will figure on specifications for rolling stock in a few days.

The Japanese Government has decided to buy 19,000 freight cars and 1,000 passenger cars during the five years beginning with 1908.

The White Pass & Yukon, which recently asked prices on a number of special design ore cars, intends to build the cars at its own shops about January, 1908.

The Public Service Corporation, Newark, N. J., is said to have ordered 250 additional street cars from the Cincinnati Car Co. Of these, 50 are for November delivery and the rest for delivery during the spring of 1908.

The Italian Government Railroads are said to have decided to ask bids in various countries on about \$5,000,000 worth of passenger and freight cars. This is understood to include all the equipment now being figured on, although heretofore the government has reserved a large part of its requirements for its own shops.

The Canadian Pacific has ordered from the Pullman Company eight first-class cars, without smoking rooms; eight second-class cars, five colonist cars and four baggage cars. The first-class cars will measure 65 ft. long and 9 ft. 10½ in. wide over frames, with varnished mahogany outside finish and mahogany interior. The second-class cars will have the same measurements and finish. The colonist cars will measure 67 ft. long and 9 ft. 10½ in. wide, over frames, and will have varnished Douglas fir outside finish and birch, mahogany stained interior. The baggage cars will measure 60 ft. long and 9 ft. 10½ in. wide, over frames, and will have the same specifications as the baggage cars reported in the *Railroad Gazette* of August 24, 1906, except that they are to be heated by direct steam, lighted by Pintsch gas, and that steel backed Diamond S brake-shoes are to be used. Bodies and underframes of all cars will be of wood. The special equipment for all cars except the baggage cars includes:

Body bolsters	Double, C. P. R. standard
Truck bolsters	Double
Brake-beams	Simplex trussed
Brake-shoes	Steel backed, diamond S, flanged
Brakes	Westinghouse, high speed
Center bearings	One of malleable iron and one of steel
Couplers	Tower
Curtain fixtures	Forsyth
Curtain material	Pantastote
Draft rigging	Miner tandem with M.C.B. class "G" spring
Dust guards	Harrison
Heating system	Steam
Journal boxes	McCord
Roofs	C. P. R. standard canvas covered
Side bearings	Susemhl
Springs	Elliptic
Trucks	Four-wheel
Wheels	Paige
Lighting system	Pintsch gas with incandescent mantles
Platforms	Standard Coupler Co.
Seats	Wheeler for first-class and second-class, and C. P. R. standard for colonist cars
Vestibules	Pullman wide

RAILROAD STRUCTURES.

BEAVER, PA.—Arrangements have been made for a joint meeting of the officials of the Pittsburgh & Lake Erie and the government engineers to consider the plans for the proposed bridge to be built over the Ohio river here. It is expected that work on the structure will be started this fall. (July 26, p. 110).

CHICO, CAL.—The Northern Electric is reported in the market for a three-span steel bridge, to be built over the Sacramento river between this place and Hamilton City.

EL PASO, TEX.—The Southern Pacific has bought 180 acres of land near this place as a site for enlarged terminal facilities. Tracks are to be laid to have a capacity of 8,000 cars.

GREENVILLE, PA.—Plans are being made by the Bessemer & Lake Erie for a large car shop to be built here. Improvements now under way will cost \$300,000.

INDIANA.—General Manager B. McKeen, of the Vandalia, is quoted as saying that extensive improvements are to be made at once on the lines of this company, including six new bridges, several new stations. Many old stations are also to be remodeled.

JACKSONVILLE, FLA.—The St. Johns River Terminal Company, which was formed by the Southern and the Georgia, Southern & Florida, it is said, will at once let the contracts for which bids were opened in July for the two new freight houses here. One of the buildings will be two stories high 30 ft. x 210 ft. and the other one story high 50 ft. x 210 ft.

LONG BEACH, CAL.—The San Pedro, Los Angeles & Salt Lake, it is said, is in the market for a Scherzer bridge to be built over the San Gabriel river.

NEW YORK, N. Y.—The New York Central has given a contract to the McClintic-Marshall Construction Co. for an additional building at its New York terminals. The work will require about 2,500 tons of steel.

OLD ORCHARD, ME.—The Boston & Maine, it is said, has bought about 30 acres of ground as a site for new tracks and a station.

PITTSBURG, PA.—It is reported that negotiations are pending between the West Side Belt and Mayor George W. Guthrie regarding an ordinance to provide for the elevation of bridges along this road in the west end.

SPRINGFIELD, OHIO.—Plans for the proposed Cleveland, Cincinnati, Chicago & St. Louis new freight house have been made, and bids for the work are to be asked for October 5th.

TOMBALL, TEX.—Grading is reported under way for the new division freight terminals of the Trinity & Brazos Valley at this place. The work includes a roundhouse, shops and other improvements to cost about \$100,000.

VANCOUVER, B. C.—The Bridge Committee are about to submit a by-law appropriating \$1,000,000 for bridges as follows: Granville street, \$500,000; Westminster avenue, \$150,000; Cambie street, \$235,000; Coal Harbor, \$55,000, and for contingencies, \$60,000.

RAILROAD CONSTRUCTION.

New Incorporations, Surveys, Etc.

APALACHIAN INTERURBAN.—This company was chartered in 1905. It proposes to build an electric line from the eastern end of Tennessee to the seaboard at Southport, N. C. Townships in Henderson and other counties have already voted favorably on the bond issue. W. A. Smith, president, Hendersonville, N. C. (See Construction Record, Mar. 16, 1896, p. 88.)

ATLANTIC & EAST COAST TERMINAL.—An officer writes that this company, which is building a terminal yard at Jacksonville, Fla., has all the grading done and track laid. The line is 2½ miles long and includes a steel bridge, for which contract has been let to the Virginia Bridge & Iron Company. J. W. Richardson, Chief Engineer, Jacksonville, Fla.

BRITISH COLUMBIA (ELECTRIC).—Work, it is said, has been started by this company on an east line to Chilliwack, B. C., 62 miles. The work is to cost about \$2,500,000, and is expected to be finished in about two years.

BUFFALO, ROCHESTER & PITTSBURG.—Contract has been given to F. Shumaker, of Bellefonte, to lay a second track on nine miles of this road from Brockwayville, Pa., north to Carmen. The work is to be started at once. It includes straightening the road and a tunnel 1,200 ft. long. These improvements will shorten the line about one mile. When this work is finished second track is to be laid from Punxsutawney to Ashland Junction. (Mar. 15, p. 380.)

CANADIAN NORTHERN.—Vice-President D. D. Mann, of this company, is quoted as saying that a line may be built from Vancouver, B. C., into northern British Columbia, to a connection with the proposed main line west from Edmonton. The project depends on the grant by the provincial government of a substantial subsidy.

CANADIAN PACIFIC.—This company, according to its annual report for the year ended June 30, 1907, has 823 miles of road under construction, mention of which was made last week, divided as follows:

ONTARIO DIVISION.

Toronto-Sudbury Line.—Muskoka, Ont., to Parry Sound, 23.3 miles; Parry Sound, Ont., to Byng Inlet, 40 miles; Byng Inlet, Ont., to Romford, 59 miles.

Guelph & Goderich.—Milverton, Ont., to Goderich, 45.5 miles; Listowel branch, 16.5 miles.

Walkerton & Lucknow.—Walkerton, Ont., to Proton, 37.5 miles.

CENTRAL DIVISION.

Stonewall Branch.—Komarno, Man., north to Teulon, 11.9 miles.

Pheasant Hills Branch.—Strassburg, Sask., west to Battle River, Alb., 360 miles.

Wolseley Reston Branch.—Kaiser, Sask., east to Reston, Man., 24.2 miles.

Moosejaw Branch.—Moosejaw, Sask., northwest 50 miles.

Souris Branch Extensions.—Stoughton-Weyburn, Sask., 37 miles; Lauder east six miles; Broomhill to Jackson, 6.9 miles.

Manitoba & North Western.—Yorktown extension, Sheho, Sask., northwest 37 miles; Bredenbury branch, Bredenbury, Sask., south one mile.

WESTERN DIVISION.

Calgary & Edmonton.—Lacombe, Alb., extension 50 miles.

PACIFIC DIVISION.

Columbia & Western.—Midway, B. C., west 2.2 miles.

Kootenay Central.—Golden, B. C., south 15 miles.

CHESAPEAKE & OHIO.—George W. Stevens, President of this company, is quoted as saying that work has been resumed on improvements which were recently suspended, including the completion of 28 miles of double-track work that had been temporarily abandoned.

CHICAGO & NORTH-WESTERN.—The report for the year ended June 30, 1907, shows that 56,497 tons of rails were laid, most of which were used to replace lighter rails, on 476.61 miles of track. During the year, 38 steel bridges, aggregating 2,361 ft. long, were added to replace wooden structures, and other wooden structures were replaced with masonry arches. The plans for the passenger terminal in Chicago call for 16 elevated tracks on a tract (three blocks) bounded by Lake street on the north, Madison street on the south, Canal street on the east and Clinton street on the west, with two four-track elevated approaches; one from the west 1.12 miles long and one from the north, .9 mile. The combined tracks of the two approaches will extend from Jefferson street to the tracks of the terminal .3 mile. The work of elevating the South Branch tracks parallel to Sixteenth street from a point 550 ft. east of Western avenue to the west line of South Canal street in the city of Chicago, 2.36 miles, has been continued during the year. Three tracks have been elevated to a maximum height of 15.8 ft. on 1.35 miles. The construction of 3,265 lineal feet of retaining walls, five subways, and foundations for three subways has been finished; and 2.53 miles of sidings, yard tracks and industry tracks have been elevated. The work of elevating the main tracks on the Milwaukee line from the end of the present elevation at Balmoral avenue, to the northern limits of the city of Chicago at Howard avenue, 2.74 miles, under way during the year, is all finished except the permanent subways. The plans called for the elevation to a maximum height of 14 ft. of the two existing main tracks; the construction and elevation of one additional main track and the construction of 1.12 miles of freight yard tracks; also the construction of 4,693 lineal feet of retaining walls and 18 subways. During the year, sidings, yard tracks and spurs have been added to serve industries aggregating 72.13 miles. At Sheboygan, Wis., a cut-off 4.12 miles has been finished; at Eland Junction, Wis., the grades of the Ashland division main tracks have been raised, the bridges and culverts permanently replaced and freight yards enlarged and improved. Important grade revisions have also been finished on this division between Sheboygan, Wis., and Bartel, and between Milwaukee and Port Washington. During the year new lines have been opened for traffic as follows: Wyoming & North Western, from Casper, Wyo., west to Lander, 147.89 miles; Manitowoc, Green Bay & North Western, between Manitowoc, Wis., and Eland Junction, and from Pulaski to Gillett, a total of 123.20 miles; Milwaukee & State Line Railway, a two-track line from the Milwaukee line near Lake Bluff, Ill., to an intersection with the same line near St. Francis, Wis., 50.24 miles; the Pierre, Rapid City & North-Western from a point .2 miles north of Fort Pierre, S. Dak., west to Rapid City, 165.48 miles, was opened for traffic in August; the Pierre & Fort Pierre Bridge Railway to connect the P. R. C. & N.W. line with the Chicago & North-Western at Pierre, 1.79 miles, including a bridge consisting of seven masonry arches, to have four fixed spans each 350 ft. long, and a draw span 445 ft. long, is expected to be opened for traffic this year. The extension from Bonesteel, S. Dak., northwest to Gregory, 25.96 miles, has been opened for traffic, and the further extension of this line from Gregory to Dallas, 4.84 miles, is expected to be finished this year. An extension has been built from Elton, Wis., east 6.6 miles, which is being further extended to Langlade, 3.36 miles. An extension has been finished from near Marathon City, Wis., to Rib Falls, 4.75 miles.

CHICAGO, ROCK ISLAND & EL PASO.—See Chicago, Rock Island & Pacific.

CHICAGO, ROCK ISLAND & GULF.—See Chicago, Rock Island & Pacific.

CHICAGO, ROCK ISLAND & PACIFIC.—J. W. Robins, General Superintendent, is quoted as saying that grading has been finished on the Chicago, Rock Island & Gulf from Amarillo, Tex., west to the Texas-New Mexico boundary, 69.87 miles, and on the Chicago, Rock Island & El Paso from that point to Tucumcari, N. Mex., 41.12 miles. According to the provisions of the charter track must be laid this year. The company is planning to begin this work shortly.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—The report of this company for the year ended June 30, 1907, shows that the company during the year added 8,474 tons of rails on 67.41 miles of track, most of which were to replace lighter rails. The extension from Hartington, Neb., to Crofton, 15.8 miles, has been opened for traffic, and it is expected that the extension from New Castle, Neb., to Wynot, 18 miles, will be opened for traffic this year. During the year second track between Merrilan, Wis., and Augusta, 21.70 miles, was put in operation, also third and fourth tracks, between East St. Paul and a new freight yard near the Harvester works, 3.2 miles, and second track between Duluth passenger station and

St. Louis river bridge, 1.86 miles. Work is under way on second track between Altoona, Wis., and Augusta, 18.98 miles. This is expected to be put in operation this year. The net increase in the side and passing tracks during the year was 17.96 miles. Work on the Minnesota & Iowa division, changing the line at Minneopa, Minn., between Ottawa and St. Peter and between Minneopa and Lake Crystal, has been finished; also on a change of alignment and grade south of Cumberland, Wis., for 2.25 miles.

COLORADO & SOUTHERN.—Local reports state that the Trinity & Brazos Valley is considering the question of removing its tracks from a point near Kirven, in Freestone county, Tex., on its Dallas-Houston line, and building a connecting line to the Fort Worth line at Mexia. The proposed change will shorten the distance several miles over the existing line which joins the main line at League.

DANVILLE & EASTERN ILLINOIS (ELECTRIC).—See Illinois Traction.

DENVER, LARAMIE & NORTHWESTERN.—This company, which was organized to build a line from Denver, Colo., to the northern boundary of Wyoming, 500 miles, is said to have secured all the right of way. In Denver ground has been bought aggregating about 160 acres as a site for terminals. (April 5, p. 499.)

EUNICE, LAFAYETTE & ABBEVILLE.—Incorporated in Louisiana with \$1,000,000 capital and office at Lafayette. The company proposes to build a line from Eunice, La., southeast via Lafayette and Abbeville to a point on the Gulf. The directors include: J. J. Lewis, President; J. N. Green, Vice-President; C. D. Caffery, Secretary and Treasurer; G. Fusilier, J. J. Stagg, P. L. De Clouet, C. D. Trahan and F. A. Godchaux.

GEORGIA-CAROLINA RAILWAY (ELECTRIC).—Local reports say that a contract is to be given by W. L. Hodges, of Hartwell, Ga., President of this company, to survey its proposed line from Athens, Ga., northeast to Anderson, S. C., 60 miles.

GRAND TRUNK.—Application is to be made by this company for permission to build a branch from St. Lambert, Que., to Brosseau station, thence north and west to the easterly entrance of the Victoria Jubilee bridge. Plans and a profile of the route have been filed.

GREAT NORTHERN.—Contract is reported let to J. H. Stewart, of Grand Forks, B. C., for grading 40 miles on the Vancouver, Victoria & Eastern, between Keremeos, B. C., and Hedley. (March 15, p. 384.)

ILLINOIS TRACTION.—The capital stock of the Springfield Belt Railway has been increased from \$5,000 to \$500,000. The company is to build a belt line from the McKinley road east of Springfield, Ill., to connect with the line south of the city limits, to avoid sending express cars through the city of Springfield. The Danville & Eastern Illinois has also increased its capital from \$5,000 to \$500,000. This company is to build a line from Danville, Ill., southeast to Terre Haute, Ind., 50 miles.

INTERSTATE TRANSFER RAILWAY.—This company, organized in Wisconsin to build a line 10 miles long from Superior, Wis., north to Duluth, Minn., has been granted a certificate of public convenience and necessity in Wisconsin. (Aug. 9, p. 164.)

JOLIET & SOUTHERN TRACTION.—This company has been authorized to issue \$1,500,000 bonds. It is understood that the proceeds will be chiefly used in the construction and equipment of new lines. Contracts have already been let to the Fisher Construction Co. to do some work. (March 15, p. 385.)

LORAIN & WEST VIRGINIA.—See Wabash.

MEXICAN PACIFIC.—Reports from Mexico City state that this company, which operates 59 miles of railroad in Mexico, proposes to build a branch from Acapulco, Mex., northwest along the Pacific coast. This is said to be a Harriman project, and is eventually to connect with the line which the Southern Pacific is building from Guaymas, southeast down the coast. The Mexican Government has granted a liberal concession to the Mexican Pacific. (Aug. 30, p. 247.)

MIDDLE CAROLINA & WESTERN.—Work, it is said, has been started by this company on its proposed line from Greenwood, S. C., on the Seaboard Air Line and the Southern Railway, southeast to Saluda, 29 miles. B. W. Crouch, of Augusta, Ga., is said to be interested in the project.

MISSISSIPPI RAILWAY.—Local reports state that a charter has been granted to this company in Mississippi with \$100,000 capital to build a line from Bay St. Louis, Miss., on the Gulf of Mexico, north to Grand Junction, Tenn. J. E. Thornton, of Pass Christian; J. L. Ross, of Mendenhall, and G. C. Sprague, of Brandon, are said to be interested.

MISSOURI & NORTH ARKANSAS.—This company, it is said, has over 1,400 men now at work on its extension between Leslie, Ark., and Searcy, 97 miles. Track has been laid on 23 miles from

Leslie, and on 30 miles between Heber and Searcy. It is expected to have trains in operation to Heber by January 1. The road is to be extended southeast to Helena, Ark. (June 21, p. 917.)

MUSKOGEE RAILWAY & NAVIGATION CO.—Incorporated in Oklahoma, with \$1,500,000 capital, and offices at Shawnee and Muskogee, to build a line from Muskogee, Ind. T., south to a point on the Fort Smith & Western, in the Choctaw Nation, 55 miles. The incorporators include: I. L. Reeves and S. M. Rutherford, of Muskogee; C. R. Dean and C. H. Gillman, of Shawnee.

NORTHERN ELECTRIC.—This company, it is said, will extend its line from Chico, Cal., north via Redbluff and Redding to Kennett, 90 miles. The company is now building an extension from Chico west to Hamilton City in Glenn County, 18 miles.

PITTSBURGH & LAKE ERIE.—Twenty-five tracks, each about half a mile long, are being laid in this company's yards at Aliquippa, Pa.

PUGET SOUND INTERNATIONAL RAILWAY & POWER COMPANY.—This company, which was incorporated in Maine last spring with a capital of \$200,000 to build an electric line from Seattle, Wash., north via Everett to Bellingham, about 100 miles, has acquired through a lease the Everett Street Railway and electric light and water properties recently bought by the Stone & Webster interests of Boston, Mass. It is understood this line is to form part of a through electric line between Seattle and Vancouver, B. C. E. W. Purdy is President; C. D. Wyman, Vice-President; Albert K. Todd, Secretary. (See Washington Roads, June 28, p. 949.)

ROBERT LEE & FORT CHADBOURNE.—According to reports from San Angelo, Tex., President Spencer of this proposed line has given a contract to J. T. Hunter to do grading. The proposed route is from Robert Lee, in Coke county, east to Winter, about 30 miles.

Roswell & Eastern.—Residents of Roswell, N. Mex., have granted to this company a bonus of \$220,000 and a right-of-way through the town. The company proposes to build a line from Roswell, N. Mex., east to Lubbock, Tex., 120 miles. Edward Kennedy, of Houston, is promoting the project. A company under this name was incorporated some time ago to build from Torrance, N. Mex., south to the Texas state line. (Mar. 15, p. 391.)

SAN DIEGO & ARIZONA.—This company, it is said, has begun building its line from San Diego, Cal., east to Yuma, Ariz., 200 miles. The company was organized in December, 1906, and bought the franchises and property of the San Diego-Eastern, projected over this route. John D. Spreckels is the principal promoter. (March 15, p. 391.)

SOUTHERN.—For suspension of work on this road see statement of President Finley on page 366.

SOUTHERN PACIFIC.—See Mexican Pacific.

SPRINGFIELD BELT RAILWAY (ELECTRIC).—See Illinois Traction.

TRINITY & BRAZOS VALLEY.—See Colorado & Southern.

VALLEJO & NORTHERN (ELECTRIC).—This company has all the right-of-way secured for a two-track electric line to be built from Vallejo, Cal., northeast to Sacramento, about 40 miles. Work is to be started at once. (March 15, p. 393.)

VANCOUVER, VICTORIA & EASTERN.—See Great Northern.

VIRGINIA AIR LINE.—This company, which was incorporated last year in Virginia with \$25,000 capital, has increased its capital to \$500,000. The company is building a line from Lindsay, Va., on the Chesapeake & Ohio south to Upper Bremo on the James River division, about 30 miles. Reports say that grading is finished from Lindsay to Palmyra, about 10 miles, and that track laying is to begin at once. T. O. Troy, President, Amherst, Va.; J. M. Robertson, Secretary, Charlottesville, Va. (March 15, p. 393.)

WABASH.—The extension, building under the name of the Lorain & West Virginia, from Wellington, Ohio, north to Lorain, about 35 miles, is reported to be now in operation. (May 24, p. 728.)

WASHINGTON, FREDERICK & GETTYSBURG (ELECTRIC).—This company has issued bonds to build and equip about 25 miles of line now under construction from Frederick, Md., north via Thurmont, to Emmitsburg. Grading has been finished on six miles and it is expected to have the line between Frederick and Thurmont finished in November. D. C. Kemp, President, Frederick, Md.

WESTERN PACIFIC.—This company has a total of 234 miles of track laid out of 929 miles of main line as follows: In California 27 miles west from Stockton to a point 52 miles of open; 26 miles from Stockton, north to the Mokelumne river; 27 miles from Marysville northwest to Oroville, and in Utah and Nevada for 154 miles from Salt Lake west to within about eight miles of Shasta, Nev., which will be the junction point with the Nevada Northern running south to Ely, Nev.

There remain three gaps to close, one of 52 miles from Oakland through Niles Canyon; a second of 62 miles from the Mokel-

umne river north through Sacramento to Marysville, and a third of 695 miles from Oroville across the Sierra Nevada to a point just east of Shasta. Work has been started on the 1,600-ft. tunnel in San Francisco, the shaft leading from Islais Creek district north into the southern section of the city, with but eight miles of track to be laid to reach Shasta from the east. It is probable that Salt Lake and Shasta will be connected, a distance of 162 miles, by October 1.

WISCONSIN CENTRAL.—This company expects to finish track laying on the extension building from Ladysmith, Wis., northwest to Superior, 105 miles, by November first. A steel bridge is being built over the Chippewa river just north of Ladysmith that will probably be finished this month. Work trains can then be run as far north as Douglas county. On the whole line there are to be 45 trestles and five steel bridges.

WICHITA, CLEVELAND & GULF.—Incorporated in Oklahoma with \$50,000,000 capital stock and office at Cleveland, Okla. The company proposes to build a line 634 miles long from Wichita, Kan., south through the counties of Sedgwick, Butler, Cowley and Chautauqua, in Kansas; the counties of Osage and Pawnee, in Oklahoma, and through the Cherokee, Creek and Choctaw nations, and the states of Arkansas, Texas and Louisiana to the gulf. The incorporators include: David Ratner, J. F. Hethering, J. C. Byers, R. L. Lunsford and A. Cecanko.

YOUNGIGHENY & CHEAT RIVER.—Incorporated in Pennsylvania with \$200,000 capital to build a line from Ohiopyle, Pa., on the Baltimore & Ohio, at the Youghiogheny river west to a point in Wharton township, Fayette county. The incorporators include: E. W. Mudge, President, Pittsburgh; C. B. Ferree, R. G. Campbell, G. C. Landers, H. N. Trimble and C. M. Thorp.

RAILROAD CORPORATION NEWS.

ALBANY & SUSQUEHANNA.—See Delaware & Hudson.

BOSTON & MAINE.—This company has sold to Bond & Goodwin, Boston, \$4,000,000 one-year 6 per cent. notes. The proceeds are to be used to refund short term notes. Most of the new notes have been disposed of and the rest are being offered at 100 $\frac{1}{4}$. See New York, New Haven & Hartford.

See Fitchburg Railroad.

CHICAGO & ALTON.—Judge K. M. Landis has announced that the promise of immunity from prosecution on account of rebates given the Standard Oil Company of Indiana will be kept. It is believed that this decision removes the most important obstacle to the ultimate consummation of the acquisition of the Chicago & Alton by the Toledo, St. Louis & Western.

DELAWARE & HUDSON.—The United States Circuit Court has handed down a decision in favor of the stockholders of the Albany & Susquehanna in their suit against the Delaware & Hudson for 12 $\frac{1}{2}$ per cent. annual dividends, as rental, instead of the 9 per cent. which the Delaware & Hudson has been paying on the A. & S. stock since 1902. The point of the suit was that the D. & H. in refunding issues of 7 per cent. and 6 per cent. A. & S. bonds with 3 $\frac{1}{2}$ per cent. convertible D. & H. bonds had effected a saving in interest charges of which the A. & S. stockholders should get the benefit under the terms of the lease; the latter therefore brought suit for increased dividends, with the above result. (Nov. 2, 1906, p. 124.)

FITCHBURG RAILROAD.—At the annual meeting on September 25, the stockholders annulled their vote of January 30, 1907, authorizing \$800,000 bonds for double-tracking between Troy, N. Y., and Johnsonville, and for the elimination of grade crossings, and, instead, authorized an issue of \$2,900,000 bonds, part of which are to be used to refund \$2,000,000 bonds maturing May 1, 1908, and the rest for the double-tracking and for other improvements. They also authorized the purchase of the Conway Street Railway, a small electric line in Conway, Franklin County, Mass., and authorized the issue of preferred stock and bonds to pay for this property. The bill allowing this purchase was passed last spring by the Massachusetts legislature.

ILLINOIS CENTRAL.—In a letter asking for proxies for the annual meeting on October 16, Stuyvesant Fish says that for some time there have been persistent efforts to put the control of the company in the hands of Union Pacific and Southern Pacific interests. The policy of the Illinois Central, operating as it does north and south lines, has been to deal with each of its east and west connections to the best advantage without making exclusive traffic alliances. It delivers more tonnage to connecting lines than it receives from them, and its control would therefore be particularly valuable to the Union Pacific and the Southern Pacific. Although the Harriman interests denied at the annual meeting

last year that the Union Pacific had an interest in Illinois Central stock, the Interstate Commerce Commission investigation in February showed that the Union Pacific had bought, before the 1906 stockholders' meeting, nearly 30 per cent. of the Illinois Central capital stock. The annual report for the year ended June 30, 1907, shows an extraordinary increase in net receipts during the last four months. During the first four months they increased \$670,000; in the next four months, after the change of presidents, they decreased \$570,000, and in the last four months they increased \$1,250,000, of which over \$600,000 was in the single month of June, and then, although neither mileage nor operating conditions had changed, the month of July, 1907, showed a decrease of \$35,000 in net revenue. A resolution of inquiry introduced by Mr. Fish was referred for answer to President Harahan, who was in charge, through an assistant, of the accounting methods which Mr. Fish questioned. Mr. Fish now asks for proxies because of the evident intention of electing Mr. Harriman and others of his selection to the Board of Directors to fill the four places on the Board.

Mr. Harahan has sent out a circular letter answering these statements. He says that the charges that Illinois Central accounts have been manipulated are absolutely untrue, and that the reports of the accounting and traffic officers, called for in the resolution referred to, show this. There has been no change in the relations of the Illinois Central with the Union Pacific and the Southern Pacific. Mr. Harahan then speaks of the reasons why Mr. Fish was dropped from the presidency. He gives specific instances of loans made by Mr. Fish from Illinois Central surplus, of which the Directors disapproved; their other reasons are given in the letter from the Directors to Mr. Fish, which was written last November and a copy of which is enclosed in Mr. Harahan's circular letter.

INTERBOROUGH-METROPOLITAN.—See New York City Railway.

IONE & EASTERN.—John Raggio, Stockton, Cal., has been appointed Receiver of this road, which runs from Ione, Cal., to Martell, 12 miles. The interest on the \$340,000 bonds is in default.

METROPOLITAN STREET RAILWAY.—See New York City Railway.

NEW YORK CITY RAILWAY.—Adrian H. Joline, President of the Missouri, Kansas & Texas, and Douglas Robinson, of the real estate firm of Douglas Robinson, Charles S. Brown & Co., have been appointed Receivers of this property on the petition of the Pennsylvania Steel Company and the Degnon Contracting Company, creditors for about \$50,000. A few months ago the assets of the company were given as about \$29,000,000 and the liabilities as about \$38,000,000. It is alleged that the floating debt amounts to \$2,000,000 and that the company cannot pay it. An immediate result of the receivership will be the passing of the guaranteed 7 per cent. dividends on Metropolitan Street Railway stock, and it is believed that since the property is now in the hands of the federal courts, the investigation of the Interborough-Metropolitan's relations with its subsidiaries, which has been carried on by the Public Service Commission for the First district, will have to stop, so far as the New York City Railway is concerned.

NEW YORK, NEW HAVEN & HARTFORD.—A special meeting of the stockholders has been called for October 30 to authorize an issue of \$35,469,500 additional capital stock. This is to be issued to stockholders and convertible debenture holders at \$125 a share to the extent of 25 per cent. of their present holdings; for this purpose, \$150 in debentures is equivalent to \$100 in stock. There are outstanding \$30,000,000 convertible debentures and \$121,878,000 stock. Part of the latter is, however, held in the treasury, having been issued by the company to itself in exchange for its own holdings in Consolidated Railway stock.

See editorial columns for President Mellen's attitude concerning the relations of this company with the Boston & Maine.

PAN-AMERICAN.—The Mexican government is said to have bought the majority of the capital stock of this company. There is \$10,000,000 authorized, of which \$1,084,600 was outstanding in April, 1906. About 200 miles of road are in operation from San Gerónimo, where it connects with the Tehuantepec National, to a point 50 miles from the Guatemala border.

SOUTHERN PACIFIC.—Gross earnings for July, 1907, were \$11,451,270, an increase of \$2,237,535; net earnings, after taxes, \$3,452,587, an increase of \$47,568. These returns were compiled after the manner of those of the Union Pacific, which see.

TOLEDO, ST. LOUIS & WESTERN.—See Chicago & Alton.

UNION PACIFIC.—Gross earnings for July, 1907, were \$7,233,994, an increase of \$1,026,165; net earnings, after taxes, \$3,041,983, a decrease of \$79,398. These earnings were compiled in accordance with the Interstate Commerce Commission's new accounting rules, and the figures for the same month in 1906 have been revised to conform with them for comparison.